

DIVISION OF FISH AND GAME OF CALIFORNIA

FISH BULLETIN No. 22

A BIBLIOGRAPHY OF THE
TUNAS

By
GENEVIEVE CORWIN

Contribution No. 87 from the California State Fisheries Laboratory

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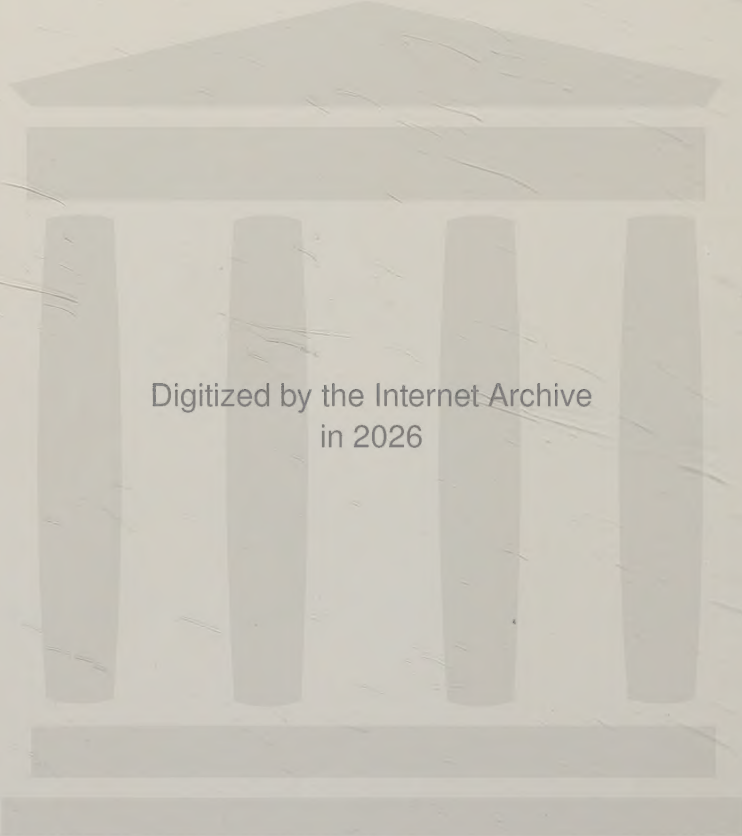




CUTTING UP THE TUNA

(From Gerhard, Eduard. *Auserlesene Griechische Vasenbilder*, hauptsächlich Etruskischen Fundorts. Berlin, G. Reimer, 1858, vol. 4, plate 316, fig. 1. By permission of the publisher.)

The scene is from an ancient Greek wine pitcher now in the State Museum of Berlin. The black figures are painted on a red background, a characteristic of the vases dating from the sixth century B. C. The wreaths worn by the men are evidence that a feast is in preparation. Note the vessel placed to catch the scraps.



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A BIBLIOGRAPHY OF THE TUNAS

By GENEVIEVE CORWIN

INTRODUCTION

Because of the commercial importance of the tunas in southern California, scientific research has directed attention to questions of their life history and abundance. In this way a need was created for a full bibliography of the literature on the subject. The work of compilation was begun by Mr. W. F. Thompson in 1918, continued by Mrs. Ruth Miller Thompson, and completed by the present compiler after nearly two years of research in a number of libraries, that of the California State Fisheries Laboratory being the first. After consulting all available material there, the writer journeyed to the libraries of Stanford University, California Academy of Sciences, Division of Fish and Game of California in San Francisco, and University of California, both in Berkeley and in Los Angeles. In the winter of 1928-1929, the work was completed as far as facilities would permit, yet publication was postponed, because a trip to New York was being planned for the summer of 1929, and the added opportunities of consulting libraries there and in Washington were too valuable to miss. The library of the American Museum of Natural History yielded much valuable material which was augmented by consultation of the card continuation of Bashford Dean's "Bibliography of Fishes." Later, three very profitable weeks were spent in Washington, D. C., working in the following libraries: National Museum, United States Department of Agriculture, United States Bureau of Chemistry, Surgeon General's Library, Library of Congress, and the United States Bureau of Fisheries.

The goal striven for was to find all works written previous to the close of 1929, dealing in any way with the five large tunas: *Thunnus thynnus*, *Neothunnus macropterus*, *Germo alalunga*, *Euthynnus pelamis*, and *Sarda chiliensis*. As one would expect, other names and species have been included for reasons which are made clear by an examination of these papers. The rule followed in puzzling questions of synonymy in the index was this: when in doubt as to what fish was being considered, the exact name was used as given in the paper. The synonyms about which there was no doubt are all given a place in the index as "see also" references and all author citations are listed under the accepted name. However, it was thought best to retain the names and spelling used by each author in the résumé of each paper. The titles fall mainly into the following groups: systematic, morphologic, biologic, commercial, the latter concerned with local conditions of fisheries of the world, and with fishing methods and gear.

The writer consulted all papers listed with the exception of a very small number, and made a short résumé of the contents of each so that a really useful subject index could be compiled. Outside help was necessary in some instances when language difficulties were encountered, since nearly every important country has contributed something to the study of the tunas. A few papers could not be found in any of the dozen libraries consulted but were considered of sufficient importance to include because of title. Wherever possible some means was

employed for checking the accuracy of the citation, but where the individual paper was not consulted the fact is indicated by a dagger †. The important papers on a given subject are indicated by an asterisk * in the list of authors.

The author names are arranged alphabetically, and where there are several papers by one individual the arrangement is chronological. If an author published more than one paper in a given year, the fact is indicated thus: Roule, 1926.1, Roule, 1926.2, meaning the first and second papers published by Roule in 1926. For papers dealing only partially with tuna, paging is given for just that portion dealing with tuna.

Abbreviations for journals were chosen with full regard to clearness, but since confusion invariably arises in some cases, it seemed advisable to include a list of all journals cited, together with their place of publication. Geographic names have not been shortened, with but one exception: U. S. standing for United States. The list is alphabetized according to the abbreviations as an aid in finding the full names.

The hearty cooperation of all the librarians is most deeply appreciated. Especial thanks are due Dr. E. W. Gudger for his able assistance, not only in offering facilities at the American Museum of Natural History including the continuation of Dean's "Bibliography of Fishes," but in giving the writer letters of introduction to other libraries, thereby opening the way to the best service possible. Mr. J. T. Nichols, Curator of Recent Fishes at the American Museum of Natural History, very kindly rendered assistance in clearing up questions of synonymy. The various individuals who were called upon for help at the United States Bureau of Fisheries and the Library of Congress deserve the warmest praise for their skilled assistance. To Mr. William Radcliffe, of Upper Deal, Kent, England, author of "Fishing from the Earliest Times," appreciation is expressed for the gift of the electro-block from which the frontispiece was made. The members of the staff of the California State Fisheries Laboratory gave valuable assistance and encouragement as the work progressed, and for this service the writer wishes to convey grateful thanks.

One of the most interesting facts ascertained by the writer during this search for information about the tunas is that these fish have been important to the life of man from the earliest times. The frontispiece gives evidence that as early as the sixth century B. C., they were of enough significance to find a place in Greek art. The fact that they have kept their life habits so closely wrapped in mystery through the march of the centuries is an added incentive to research. Although freedom from error has been the shining goal constantly striven for, the writer is aware perfection has not been attained, yet this bibliography is submitted in the eager hope that it may prove in the nature of an organized list of clues that may help point the way to a solution of the mystery shrouding the life of the tunas.

December, 1929.

AUTHORS' LIST OF TITLES

NOTE.—The most important papers are marked thus: *. Those marked with a dagger † were not seen by the compiler but were included because they seemed important. Inconsistencies in the spelling of scientific names arise from the fact that the exact spelling was used as that found in the paper cited. The numbers in bold face type (such as: **6**) indicate volume number.

A

Adams, Walter Marsham.

1883. A popular history of fisheries and fishermen of all countries, from the earliest times. Intern. Fish Exhib. Lit., Handbook 1, pt. 1, **6** art., p. 18, 19.

Mode of capture of tuna by ancient Greeks; derivation of name.

Aeschylus.

1922. Aeschylus, with an English translation by Herbert Weir Smyth. New York, 1922-1926, 1, line 424ff.

Afalo, F. G.

1904. British salt-water fishes with a chapter on the artificial culture of sea fish by R. B. Marston. London, p. 13, 271, 282-283.

Orcynus thynnus, *O. germo*, *Thynnus pelamys*, listed as rare fishes in English waters; range.

Agassiz, Louis.

1833. Recherches sur les poissons fossiles. Neuchatel, 1833-1843, 5, p. 55-60. Atlas pls. 23, 24, 27.

Fossils of *Thynnus propterygius*, *T. bolcensis*, *Orcynus lanceolatus*, *O. lator*, from Monte Bolca, described.

Aldrovandi, Ulisse.

1613. De piscibus libri V, et de cetis liber unus. Bononiae, bk. III, ch. 18, p. 307-324.

Thynnus thunnus and *Orcynus rondel* figured; synonymy; description; distribution; natural history. Titles of chapters on tuna: age; methods of catch; uses as food; uses as medicine.

Allen, Edward Johnson.

- 1926+. Current bibliography. Journ. Conseil, 1926, 1, no. 3, p. 300, no. 4, p. 382; 1927, 2, no. 1, p. 106, no. 2, p. 266, no. 3, p. 395; 1928, 3, no. 1, p. 130.

Allgemeine Fischerei-Zeitung.

1912. Der Thunfischfang im Atlantischen Ozean. Allg. FischZeitg., no. 3, p. 74.

Amico, F. C. de.

- †1816. Osservazioni pratiche intorno la pesca, il corso, il cammino dei tonni. Messina.

Practical observations about the Italian fishery, the migrations, and the route of the tuna.

Angotzi, Francesco.

- †1905. L'industria delle tonnare in Sardegna. Bologna.

Tuna industry in Sardinia.

Anuario Estadístico de la Marina Mercante y de la Pesca Marítima. 1914.

1915. Madrid.

Statistics.

Apicius.

1542. In hoc opere contenta Apicii Caelii de opsoniis et condimentis, sive arte coquinaria libri X. Item. Gabrielis Humel bergii . . . annotationes. Tigvri, In officina Froschouiana.

Ancient recipes for preparation as food.

Argentier, ———.

1914. Étude d'ensemble sur les pêches de la sardine, du thon et des crustacés. VI Cong. Nat. Pêch. Marit. Tunis. Paris, 2, p. 105-127.

Thynnus vulgaris; *T. thunina*; *T. alalonga*; fishery methods; boats; gear; value of fishery; canning; distribution of product.

✕ Aristotle.

1897. History of animals. Ten books. Translated by Richard Cresswell. London. Bk. 5, ch. 25, p. 3; bk. 6, ch. 16, p. 5; bk. 8, ch. 15, p. 5; bk. 8, ch. 17, p. 2, 3; bk. 8, ch. 20, p. 8, 9; bk. 9, ch. 3, p. 1.

Parasites; reproduction; delights in warm weather; migrations governed by poor sight; goes into mud in winter; travels in schools.

Årsberetning Vedkommende Norges Fiskerier.

1928. Fremme av størjefangsten. Årsber. Vedkom. Norges Fisk. [for 1927] no. 1, p. 89-90.

Fishery in foreign countries.

Artedi, Peter.

1738. Ichthyologia, sive opera omnia de piscibus scilicet. Pt. 1. Bibliotheca ichthyologica. Pt. 2. Philosophia ichthyologica. Pt. 3. Generum Piscium. Pt. 4. Synonymia specierum. Pt. 5. Descriptiones specierum. Lugduni Batavorum, Leyden.

Pt. 1, p. 49-50: *Thunnus*, different spellings, references in literature. Pt. 3, p. 210-211: *Thunnus*, description. Pt. 4, p. 49: *Thunnus thynnus*, *T. orcyneus*, *T. belloni*, synonymy.

Atco Fisheries News.

1926. The tunas, albacores and bonitos. Atco Fish. News, 6, no. 4, p. 6.

Short description and use of *Germo macropterus*, *G. alalunga*, and *Thunnus thynnus*; *Germo alalunga* figured.

Athanassopoulos, G.

1923. Sur les thonnidés en Grèce. C. R. Acad. Sci. Paris, 177, p. 501-502. Also in Pêch. Marit., 1923, 6, no. 283, p. 767-768.

Migrations.

1924. Note complémentaire sur les "Thonnidés" en Grèce (Méditerranée orientale). Bull. Inst. Océanogr. Monaco, no. 440, p. 1-3.

Migrations.

1926. Notes sur la faune marine de la Grèce. Bull. Inst. Océanogr. Monaco, no. 480, p. 2-3.

Migrations.

✕ 1927. La migration des thons. Pêch. Marit., 10, no. 452, p. 51.

Aubertin, ———.

1909.1. La pêche du thon en Méditerranée. V Cong. Nat. Pêch. Marit. Sables-d'Olonne, 1, p. 196-220.

Methods of fishing in Mediterranean; statistics of fish caught by each method.

1909.2. La pêche du thon. Bull. Trim. Pêch. Marit., 14, p. 1129-1151.

Methods of fishing and gear in Mediterranean; statistics.

Ausland.

1861. Sudfranzösische Thunfischerei. Ausland, 34, no. 52, p. 1248.

Condition of fishery of southern France for season.

Avolio, François de Paule.

†1805. Sur les lois de la Sicile relative à la pêche. Palermo, p. 75.

Laws governing tuna fishery.

B

Baird, Spencer Fullerton.

1873. List of fishes collected at Wood's Hole. Rept. U. S. Fish Comm. [for 1871-1872] p. 825.

Orcynus secundi-dorsalis, *O. alliteratus*, recorded.

Barnard, K. H.

1927. A monograph of the marine fishes of South Africa. Pt. II. (Teleostei-Discocephali to end. Appendix.) Ann. South African Mus., 21, pt. 2, p. 798-799.

Thunnus thynnus, *Germo alalunga*; synonymy; description; habitat; range.

Barnhart, P. S.

†1927. Pelagic fish eggs off La Jolla, California. Bull. Scripps Instn. Tech. Ser., 1, no. 8, p. 91.

Sarda chiliensis, spawning season.

Barnhill, O. H.

1928. How California is utilizing mechanical refrigeration. Fish. Gaz., New York, 45, no. 11, p. 19-21.

Baschieri, Adolfo.

1907. Sulla intossicazione prodotta dal tonno. Bull. Sci. Mediche, ser. 8, 7, p. 161, 557-564.

Poisoning produced by tuna.

Baskett, James Newton.

1899. The story of the fishes. New York, p. 268.

Orcynus thynnus; description; figure.

Bassani, Francesco.

- †1891. Contributo alla paleontologia della Sardegna. Ittioloti Miocenici. Atti Accad. Sci. Napoli, 2. ser. 4, no. 3.

Thynnus sp. from Miocene of Sardinia.

Bassett-Smith, P. W.

1903. Snake-bites and poisonous fishes. Journ. Bombay Nat. Hist. Soc., 1903-1904, 15, p. 126.

Bean, Tarleton Hoffman.

1903. Catalogue of the fishes of New York. Bull. New York Mus., no. 60; 56. Ann. Rept. New York Mus., 3, p. 391-393, 742.

Thunnus thynnus; range; records; description; seasonal movements; synonymy; fishery; growth in first year; size; killer whale as enemy; angling.

1906. A catalogue of the fishes of Bermuda, with notes on a collection made in 1905 for the Field Museum. Publ. Field Mus., no. 108, zool. ser., 7, no. 2, p. 46.

Thunnus thynnus recorded.

Belli, C. M.

- †1920. Il tonno salato sotto il punto di vista dell'igiene. Ann. Med. Nav., Roma, 1, p. 42-47.

Salt tuna as food.

Belloc, G.

- 1927.1. Rapport sur le fonctionnement du laboratoire de La Rochelle. Notes Off. Pêch. Marit., no. 52, p. 23.

Temperature of water governing migrations of *Thynnus alalunga*; expedition of Hébé extending researches.

- *1927.2. Rapport sur la croisière du thonier "Hébé." Notes Off. Pêch. Marit., no. 52, p. 37-48.

Report of expedition: temperature of water in relation to habitat, food and migrations of the germon or albacore.

- 1927.3. Le comportement du germon (*Thynnus alalunga* Gm.) dans les couches d'eau tièdes de faibles épaisseur. C. R. Acad. Sci. Paris, 184, p. 950-951.

Effect of temperature on migrations of *Thynnus alalunga*.

- 1927.4. Remarques sur le germon (*Thynnus alalunga*). Proc.-Verb. Cons. Explor. Mer, 44, pt. 2, p. 92-97.

Food and fishery of *Thynnus alalunga* in Madeira and Canaries.

Bellón Uriarte, Luis.

- *1925. Cómo se descuartiza el atún. Bol. Pesca, 10, no. 101, p. 1-5.

Methods of cutting tuna for canning.

- *1926.1. Preparación de conservas de atún. La cocción de la carne. Bol. Pesca, 11, no. 116, p. 97-101.

Methods of canning.

- *1926.2. La industria del atún en España. Res. Camp. Acuerd. Intern., no. 3, 98 p.

Catch figures; factory layouts and equipment; list of packers; personnel of factories; detailed diagram of layout of factory; methods of canning and salting; by-products; distribution.

Belon, Pierre.

1553. De aquatilibus libri duo. Cum eiconibus ad vivam ipsorum effigiem, quoad eius fieri potuit, expressis. Parisiis, p. 106-107.

Thynnus, description.

Beneden, Pierre J. van.

1871. Les poissons des côtes de Belgique, leurs parasites et leurs commensaux.
Mém. Acad. R. Belgique [for 1870] 38, p. 57.
Parasites and commensals of *Thynnus vulgaris*.

Bennett, Frederick Debell.

1840. Narrative of a whaling voyage around the globe, from the year 1833 to 1836. London, 2, p. 278-281.
Scomber germon; description; coloration; food; shoaling habits in Pacific Ocean.

Bigelow, Henry B.

1925. Fishes of the Gulf of Maine. Bull. U. S. Bur. Fish. [for 1924] 40, pt. 1, p. 212-215.
Thynnus thynnus; description; color; size; range; food and habits; commercial importance.

Bleeker, P.

1844. Bijdragen tot de geneeskundige topographie van Batavia generisch overzicht der fauna. Nat. Geneesk. Arch. Neerland's-Indië, 1, p. 553.
Thynnus recorded.

1852. Bijdrage tot de kennis der makreelachtige visschen van den Soenda-Molukschen Archipel. Verh. Batavia Genoot. Kunst. Wetens., 24, p. 36, 37, 89.

Thynnus thunnina, *T. tonggol* and *T. macropterus* recorded from Dutch East Indies.

1856. Beschrijvingen van nieuwe en weinig bekende vischsoorten van Amboina, versameld op eene reis door den Molukschen Archipel, gedaan in het gevolg van den Gouverneur-Generaal Duymaer van Twist in September en October 1855. Act. Soc. Sci. Indo-Neerlandicae, 1, p. 41.

Thynnus pelamys recorded from Dutch East Indies.

- 1860.1. Achtste bijdrage tot de kennis der vischfauna van Sumatra. Visschen van Benkoelen, Priaman, Tandjong, Palembang, en Djambi. Act. Soc. Sci. Indo-Neerlandicae, 3, p. 29.

Thynnus pelamys, *T. thunnina* recorded from Dutch East Indies.

- 1860.2. Dertiende bijdrage tot de kennis der vischfauna van Celebes. Visschen van Bonthain, Badjoa, Sindjai, Lagoesi en Pompenoea. Act. Soc. Sci. Indo-Neerlandicae, 3, p. 38.

Thynnus thunnina recorded from Dutch East Indies.

- 1860.3. Over eenige vischsoorten van de Kaap de Goede Hoop. Nat. Tijdschr. Nederlandsch-Indië, 21, p. 53.

Thynnus pelamys recorded from Cape of Good Hope.

- 1861.1. Mededeeling omtrent vischsoorten, nieuw voor de kennis der fauna van Singapoera. Versl. Akad. Amsterdam, 12, p. 52.

Thynnus thunnina, *T. tonggol*, recorded from Singapore.

- 1861.2. Iets over de vischfauna van het eiland Pinang. Versl. Akad. Amsterdam, 12, p. 74.

Thynnus affinis recorded from Dutch East Indies.

1862. Sixième mémoire sur la faune ichthyologique de l'île Batjan. Versl. Akad. Amsterdam, 14, p. 109.

Thynnus thunnina, *T. macropterus*, *Pelamys macropterus*, *Thynnus pelamys*, *Pelamys pelamys*, recorded from Dutch East Indies.

1865. Sixième notice sur la faune ichthyologique de Siam. Nederlandsch Tijdschr. Dierk., 2, p. 173.

Thynnus thunnina recorded.

1875. Recherches sur la faune de Madagascar et de ses dépendances d'après les découvertes de François P. L. Pollen et D.C. van Dam. 4^e Partie. Poissons de Madagascar et de l'île de la Réunion. Leide, p. 100.

Thynnus thunnina, *Pelamys thunninus*, *Thynnus thynnus*, recorded.

1879. Enumération des espèces de poissons actuellement connues du Japon et description de trois espèces en édités. Versl. Akad. Amsterdam, 18, p. 15.

Thynnus sibi Schl. and *Pelamys sibi* Blkr. compared.

Bloch, Marc Elieser, and Schneider, Johann Gottlob.

1801. Systema ichthyologiae iconibus ex illustratum. Berolini, p. 21-22.

Thynnus sp.; short description; range.

Boisacq, Émile.

1913. Dictionnaire etymologique de la langue greque. Paris, p. 779.

Derivation of name pelamyde (young tuna).

Boletín de Pesca.

1917. Reglamento de almadrabas (continuación). Bol. Pesca, 2, no. 9-10, p. 105-118.

Laws regulating almadraba fishery.

1922.1. La vida de la albacora (*Th. alalunga*) o bonito del Norte, en relación con la temperatura de las aguas. Bol. Pesca, 7, no. 68-70, p. 222.

Relation of temperature to albacore.

1922.2. La pesca del atún en Tripoli. Bol. Pesca, 7, no. 76, p. 429.

1924.1. Ciclos de aumento y disminución del atún en Portugal. Bol. Pesca, 9, no. 90-91, p. 87.

Periodical appearance of tuna in Portugal.

1924.2. Primeros resultados de la campaña internacional para el estudio del atún. Bol. Pesca, 9, no. 92-93, p. 139-141.

Résumé of hydrographic conditions (temperature, salinity) affecting migrations.

1924.3. Reglamento para la pesca del atún con el arte de almadrabas. Bol. Pesca, 9, no. 95-96, p. 215-230.

Laws regulating almadraba fishery of Spain.

1924.4. La pesca en Portugal. Proyecto de reglamento para la pesca del atún con artes fijos. Bol. Pesca, 9, no. 97-98-99, p. 277-307.

Regulations protecting tuna fisheries in Portugal.

1925.1. Legislación sobre almadrabas. Bol. Pesca, 10, no. 101, p. 16-18; no. 102, p. 61-63; no. 103, p. 92-95; no. 104, p. 141-144; no. 106, p. 209-211; no. 107, p. 250-251; no. 108-109, p. 305-307; no. 110, p. 330-334; no. 112, p. 393-397.

Legislation in regard to almadraba fishery in Spain.

1925.2. La pesca del atún en aguas atlánticas del sur de España. Bol. Pesca, 10, no. 102, p. 60-61.

Fishery of Spain.

1925.3. Subasta de la almadraba Nuestra Señora de las Mercedes. Bol. Pesca, 10, no. 102, p. 63-67.

Public sale of an almadraba fishery in Spain.

1925.4. La pesca del atún en Túnez (1924). Bol. Pesca, 10, no. 105, p. 179-180.

Fishery in Tunis.

1925.5. Mala temporada en la pesca del atún. Bol. Pesca, 10, no. 106, p. 225.

Fishery in Spain.

1925.6. Reglamento para el regimen de la pesca con el arte denominado de almadraba. Bol. Pesca, 10, no. 111, p. 351-379.

Laws regulating almadraba fishery.

1926.1. Legislación sobre almadrabas. Bol. Pesca, 11, no. 113, p. 8; no. 114, p. 50; no. 115, p. 80-81; no. 119, p. 194-196.

Legislation concerning almadraba fishery.

1926.2. El atún de Canarias. Bol. Pesca, 11, no. 113, p. 12.

Fishery: note on total catch in the Canaries.

1926.3. El atún en los mares del Norte. El atún en los fjords noruegas. Bol. Pesca, 11, no. 113, p. 17, 18.

Note on fisheries in Norway and North Sea.

1926.4. Subasta de la almadraba "Lances de Tarifa." Subasta de la almadraba "Rosita." Bol. Pesca, 11, no. 117, p. 150-153.

Sale of two almadraba fisheries.

1926.5. El atún en Sicilia. Bol. Pesca, 11, no. 117, p. 168-172.

Description of factory and industry in Sicily; illustrated.

1926.6. Almadrabas caladas en 1926 (Atlántico y lugares próximos). Almadraba "Calpe." Bol. Pesca, 11, no. 118, p. 177-178.

Condition of fishery in Spain.

1926.7. La pesca del atún. Bol. Pesca, 11, no. 118, p. 188-190.

Gig fishing described and illustrated.

Boletín de Pesca—Continued.

- 1926.8. La pesca del atún y del bonito en el Cantábrico. Bol. Pesca, 11, no. 123, p. 304-305.
The tuna and bonito fishery of Cantabrio.
 - 1926.9. Almadrabas (Del primer negociado de la Dirección General de Pesca). Bol. Pesca, 11, no. 121, p. 236-238; no. 122, p. 262-263; no. 123, p. 298-300.
Legislation concerning almadraba.
 - 1926.10. Almadrabas (Del primer negociado, sección segunda). Bol. Pesca, 11, no. 124, p. 238-240.
Statistics: returns from different almadraba fisheries in Spain.
 - 1927.1. Asamblea de almadrabereros y taraferos. Bol. Pesca, 12, no. 125, p. 17-18.
Meeting of almadraba fishermen, Spain.
 - 1927.2. Almadrabas (Del primer negociado, sección segunda). Bol. Pesca, 12, no. 125, p. 19-21; no. 129, p. 148; no. 130, p. 162-163; no. 131, p. 204-205.
Legislation concerning almadraba.
 - 1927.3. La pesca del atún en el Sahara occidental español. Fernando de Buen, sobre biología del atún, su pesca y conservación de sus carnes. Bol. Pesca, 12, no. 128, p. 99, 108-110.
Spawning off African coast; gear; migrations.
 - 1927.4. La pesca de la sardina y del atún en aguas atlánticas del sur de España. Bol. Pesca, 12, no. 129, p. 148-151.
Fishery of Spain.
 - 1927.5. Almadrabas (Sección II, Negociado I). Bol. Pesca, 12, no. 132, p. 241; no. 136, p. 360-361.
Regulations in regard to almadraba.
 - 1928.1. Almadrabas (Sección 2, Negociado 1). Bol. Pesca, 13, no. 137, p. 13; no. 142, p. 189.
Regulations concerning almadraba.
 - 1928.2. Escombridos de la región Balear. Bol. Pesca, 13, no. 138, p. 54-57.
Thunnus thynnus, statistics of catch.
 - 1928.3. Dirección General de Pesca. Consorcio entre el estado y los almadrabereros. Laboratorios costeros. Bol. Pesca, 13, no. 140, p. 117-125.
Legislation about partnership between state and almadraba fishery; catch observations of laboratory of Baleares.
 - 1928.4. La pesca del atún en Túnez. Bol. Pesca, 13, no. 140, p. 128-129.
Fishery of Tunis.
 - 1928.5. Consorcio almadraberero. Bol. Pesca, 13, no. 143, p. 219.
Partnership of almadraba fishermen.
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1875. La trêve des filets trainants. Bull. Soc. Acclim. France, 3. sér. 2, p. 453-457.

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V

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1873. Report upon the invertebrate animals of Vineyard Sound and the adjacent waters, with an account of the physical characteristics of the region. Rept. U. S. Fish Comm. [for 1871-1872] p. 516.
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W

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1890. Evidence of a fossil tunny from the coralline crag. *Ann. Mag. Nat. Hist.*, ser. 6, 5, p. 294-296.

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Italian method of tuna fishing.

Y

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1836. A history of British fishes illustrated by nearly 400 woodcuts. London, 1, p. 134-139.

Synonymy; spawning habits (quoted as "said to be"); methods of fishing and preservation; description of *Thynnus vulgaris*, *T. pelamys*; synonymy; description; figures.

Z

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- †1883.1. La pesca e l'industria del tonno in Italia ed all'estero. Tipograf. A. Ciminago, Genova, 120 p.

Tuna fishery in Italy.

- †1883.2. Ulteriori osservazioni sul regime daziario dei tonni, ecc. Tipograf. Ricci, Firenze, 80 p.

Observations pertaining to the tariff regulations on tuna in Italian fishery.

- †1887. Riflessioni sul progettato aumento di dazio d'entrata del tonno sottolio, ecc. Palermo (Ristampa, Genova).

Plans for increasing the revenue tax on tuna oil, etc.

- †1905. Raccolta di documenti e sentenze di tribunali comprovanti il danno che arrecano le acque torbide, ecc., nelle tonnare di Porto Paglia e P. Scuso opusc. Tipograf. cooper. Leonina, Roma, 72 p.

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LIST OF ABBREVIATIONS USED FOR PERIODICALS CITED

A

- Aarsber. Selsk. Norske Fisk. Fremme.—Aarsberetning for Selskabet for de Norske Fiskeriers Fremme. Bergen.
- Abh. Akad. Wiss.—Abhandlungen. Akademie der Wissenschaften zu Berlin.
- Abh. K. Preussische Akad. Wiss.—Abhandlungen. K. Preussische Akademie der Wissenschaften. Berlin.
- Act. Soc. Sci. Indo-Neerlandicae.—Acta Societatis Scientiarum Indo-Neerlandicae. Batavia.
- Allg. FischZeitg.—Allgemeine Fischereizeitung. München.
- American Journ. Sci.—American Journal of Science. New Haven.
- An. Soc. Española Hist. Nat.—Anales de la Sociedad Española de Historia Natural. Madrid.
- Ann. Agric. Min. Agric. Ind. Comm.—Annali di Agricoltura. Ministero di Agricoltura, Industria e Commercio. Roma.
- Ann. Hydrogr. Paris.—Annales Hydrographiques. Paris.
- Ann. Inst. Océanogr. Monaco.—Annales de l'Institut Océanographique de Monaco. Monaco.
- Ann. Mag. Nat. Hist.—Annals and Magazine of Natural History. London.
- Ann. Micr. Paris.—Annales de Micrographie. Paris.
- Ann. Mus. Hist. Nat. Marseille.—Annales du Musée d'Histoire Naturelle de Marseille. Marseille.
- Ann. New York Acad. Sci.—Annals of the New York Academy of Sciences. New York.
- Ann. Rept. Comm. Inland Fish. Rhode Island.—Annual Report of the Commissioners of Inland Fisheries of the State of Rhode Island. Providence.
- Ann. Rept. Fish. Board Scotland.—Annual Report of the Fishery Board for Scotland. Edinburgh.
- Ann. Rept. Laguna Mar. Lab.—Annual Report of the Laguna Marine Laboratory. Claremont, California.
- Ann. Rept. New Jersey Mus.—Annual Report of the New Jersey State Museum. Trenton.
- Ann. Rept. New York Mus.—Annual Report of the New York State Museum of Natural History. Albany.
- Ann. Sci. Géol.—Annales des Sciences Géologiques, ou Archives de Géologie, de Minéralogie, de Paléontologie . . . Paris.
- Ann. Sci. Nat. Paris.—Annales des Sciences Naturelles. (a) Botanique. (b) Zoologie. Paris.
- Ann. Sci. Nat. Porto.—Annaes des Sciencias Naturaes. Porto.
- Ann. Scottish Nat. Hist.—Annals of Scottish Natural History. Edinburgh.
- Cont'd as Scottish Naturalist.
- Ann. South African Mus.—Annals of the South African Museum. Cape Town.
- Ann. Sta. Océanogr. Salammô.—Annales. Station Océanographique de Salammô. Tunis.
- Annu. Mus. Zool. Univ. Napoli.—Annuario R. Museo Zoologico della R. Università di Napoli. Napoli.
- Anu. Com. Perm. Pesca.—Anuario de la Comisión Permanent de Pesca. Madrid.
- Anu. Estadís. Pesca.—Anuario Estadístico de la Marina Mercante y de la Pesca Marítima. Madrid.
- Aquatic Life. Philadelphia.
- Arb. Zool. Inst. Wien.—Arbeiten aus dem Zoologischen Institut der Universität Wien, und der Zoologischen Station in Triest. Wien.
- Arch. Farmacol. Speriment.—Archivio di Farmacologia Sperimentale e Scienze Affini. Roma.
- Arch. Italiennes Biol.—Archives Italiennes de Biologie. Pise.
- Arch. Parasit.—Archives de Parasitologie. Paris.
- Arch. Sci. Phys. Nat.—Archives des Sciences Physiques et Naturelles. Genève, Lausanne, Paris.
- Årsber. Vedkom. Norges Fisk.—Årsberetning Vedkommende Norges Fiskerier. Bergen.
- Atco Fish. News.—Atco Fisheries News. New York.

- Atti Accad. Gioenia Sci. Nat.—Atti della R. Accademia Gioenia di Scienze Naturali. Catania.
 Atti Accad. Sci. Torino.—Atti R. Accademia delle Scienze di Torino. Turin.
 Atti Cong. Assoc. Med. Italiana—Atti del Congresso. Associazione Medica Italiana.
 Atti Min. Agric. Ind. Comm.—Atti Ministero di Agricoltura, Industrie e Commercio. Roma.
 Atti Soc. Ligustica Sci. Nat. Geogr.—Atti della Società Ligustica di Scienze Naturali e Geografiche. Genova.

B

- Bergens Mus. Aarb.—Bergens Museums Aarbok. Bergen.
 Ber. Komm. Untersuch. Kiel.—Bericht der Kommission zur Untersuchung der Deutschen Meere in Kiel. Berlin.
 Bienn. Rept. California Fish Game Comm.—Biennial Report. California Fish and Game Commission. Sacramento.
 Bol. Pescas.—Boletín de Pescas. Instituto Español de Oceanografía. Madrid.
 Bol. Rev. Geogr. Col. Merc. Madrid.—Boletín. Revista de Geografía Colonial y Mercantil. Sociedad Geográfica. Madrid.
 Boll. Bimest. Talasso. Italiano.—Bollettino Bimestrale R. Comitato Talassografico Italiano. Venezia. *Formerly* Bollettino del Comitato Talassografico. Roma.
 Boll. Consoli.—Bollettino del Consoli. Roma.
 Boll. Inform. Econ. Min. Colonie.—Bollettino di Informazioni Economiche del Ministero delle Colonie. Roma.
 Boll. Min. Agric. Ind. Comm.—Bollettino Ufficiale del Ministero d'Agricoltura, Industria e Commercio. Roma.
 Boll. Mus. Zool. Anat. Comp. Torino.—Bollettino dei Musei di Zoologia e di Anatomia Comparata della R. Università. Torino.
 Boll. Notiz. Agrarie.—Bollettino di Notizie Agrarie. Roma.
 Boll. Pesca Piscicolt. Idrobiol.—Bollettino di Pesca, Piscicoltura e di Idrobiologia. Ministero dell'Economia Nazionale. Roma.
 Boll. Sci. Mediche.—Bollettino delle Scienze Mediche. Bologna.
 Boll. Soc. Geogr. Italiana.—Bollettino della Società Geografica Italiana. Roma.
 Boll. Soc. Lombardo Pesca Aquicolt.—Bollettino. Società Lombardo per la Pesca e l'Aquicoltura. *Formerly* Rivista Mensile di Pesca. Pavia.
 Boll. Soc. Med. Prov. Bergamo.—Bollettino. Società Medica Provinciale di Bergamo. Bergamo.
 Boll. Soc. Zool. Italiana.—Bollettino della Società Zoologica Italiana. Roma.
 Boll. Talasso. Italiano.—Bollettino del Comitato Talassografico. Roma. *Cont'd as* Bollettino Bimestrale R. Comitato Talassografico Italiano. Venezia.
 Bull. American Mus.—Bulletin of the American Museum of Natural History. New York.
 Bull. Biol. France Belgique.—Bulletin Biologique de la France et de la Belgique. Paris. *Formerly* Bulletin Scientifique de la France et de la Belgique. Londres, Paris, Berlin.
 Bull. Bishop Mus.—Bulletin. Bernice P. Bishop Museum. Honolulu.
 Bull. Comm. Explor. Méditerranée.—Bulletin. Commission internationale pour l'Exploration Scientifique de la Mer Méditerranée. Monaco.
 Bull. Inst. Océanogr. Monaco.—Bulletin de l'Institut Océanographique de Monaco. Monaco. *Formerly* Bulletin du Musée Océanographique de Monaco.
 Bull. Méd. Vosges.—Bulletin Médical des Vosges. Rambervillers.
 Bull. Mus. Hist. Nat. Paris.—Bulletin du Muséum d'Histoire Naturelle. Paris.
 Bull. New York Mus.—Bulletin of the New York State Museum of Natural History. Albany.
 Bull. New York Zool. Soc.—Bulletin of the New York Zoological Society. New York.
 Bull. Sci. France Belgique.—Bulletin Scientifique de la France et de la Belgique. Londres, Paris, Berlin. *Cont'd as* Bulletin Biologique de la France et de la Belgique. Paris.
 Bull. [sic] Sci. Mediche.—Bollettino delle Scienze Mediche. Bologna.
 Bull. Scripps Instn.—Bulletin. Scripps Institution for Biological Research. University of California. Berkeley.
 Bull. So. California Acad. Sci.—Bulletin of the Southern California Academy of Sciences. Los Angeles.

Bull. Soc. Acclim. France.—Bulletin de la Société Nationale d'Acclimatation de France. Paris.

Bull. Soc. Belge Géol. Paléont. Hydrol.—Bulletin de la Société Belge de Géologie, de Paléontologie et d'Hydrologie. Bruxelles.

Bull. Soc. Centr. Aquicult. Pêch.—Bulletin de la Société Centrale d'Aquiculture et de Pêche. Paris.

Bull. Soc. Hist. Nat. Afrique Nord.—Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord. Alger.

Bull. Soc. Nat. Moscou.—Bulletin de la Société des Naturalistes de Moscou. Moscou.

Bull. Soc. Océanogr.—Bulletin de la Société d'Océanographie de France. Paris.

Bull. Soc. Portugaise Sci. Nat.—Bulletin de la Société Portugaise des Sciences Naturelles. Lisbonne.

Bull. Soc. Sci. Hist. Nat. Corse.—Bulletin de la Société des Sciences Historiques et Naturelles de la Corse. Bastia.

Bull. Soc. Sci. Nat. Maroc.—Bulletin de la Société des Sciences Naturelles de Maroc. Maroc.

Bull. Soc. Zool. France.—Bulletin de la Société Zoologique de France. Paris.

Bull. Sta. Aquic. Pêch. Castiglione.—Bulletin des Travaux. Station d'Aquiculture et de Pêche de Castiglione. Alger.

Bull. Sta. Océanogr. Salammbô. Bulletin. Station Océanographique de Salammbô. Tunis.

Bull. Trim. Pêch. Marit.—Bulletin Trimestriel de l'Enseignement Professionnel et Technique des Pêches Maritimes. Orléans, Paris.

Bull. U. S. Bur. Fish.—Bulletin of the [United States] Bureau of Fisheries. Washington. *Formerly* Bulletin of the United States Fish Commission. Washington.

Bull. U. S. Fish Comm.—Bulletin of the United States Fish Commission. Washington. *Cont'd as* Bulletin of the [United States] Bureau of Fisheries.

C

C. R. Acad. Sci. Paris.—Compte Rendu Hebdomadaire des Séances de l'Académie des Sciences. Paris.

C. R. Assoc. Française Avanc. Sci.—Compte Rendu de l'Association Française pour l'Avancement des Sciences. Paris.

C. R. Cong. Soc. Sav., Paris, Dijon.—Compte Rendu. Congrès des Sociétés Savantes de Paris, tenu à Dijon.

C. R. Soc. Biol. Paris.—Compte Rendu Hebdomadaire des Séances et Mémoires de la Société de Biologie. Paris.

California Fish.—California Fisheries. San Pedro, California. *Cont'd as* West Coast Fisheries.

California Fish Game.—California Fish and Game. Sacramento.

Canadian Fish.—Canadian Fisherman. Gardenvale.

Commun. Acad. Mar. Paris.—Communications et Mémoires. Académie de Marine. Paris.

Cong. Intern. Pêch. Marit.—Congrès International des Pêches Maritimes, d'Ostréiculture, et d'Aquiculture Marine. Dieppe; *and* Paris.

Cong. Nat. Pêch. Marit.—Congrès National des Pêches Maritimes tenu à Tunis; Orleans; *and* Sables d'Olonne. Paris.

Contrib. Biol. Hopkins Lab.—Contributions to Biology from the Hopkins Seaside Laboratory of the Leland Stanford Jr. University. Palo Alto.

Copeia. New York.

Cosmos. Revue des Sciences et leurs Applications. Paris.

D

Dir. Gen. Mar. Mer.—Direzione Generale della Marina Mercantile. Roma.

E

Edinburgh Philos. Journ.—Edinburgh New Philosophical Journal. Edinburgh.

F

- Fauna och Flora. Upsala.
Fischerbote.—Der Fischerbote. Hamburg.
Fischwirtschaft.—Die Fischwirtschaft. Wesermünde.
Fish. Bull. Div. Fish Game California.—Fish Bulletin. Division of Fish and Game of California. Sacramento.
Fish. Gaz. London.—Fishing Gazette. London.
Fish. Gaz. New York.—Fishing Gazette. New York.
Fish. News.—Fishing News. London.
Fish Oyster Repr.—Fish and Oyster Reporter. Tampa.
Fish Trades Gaz.—Fish Trades Gazette. London.
Fiskets Gang. Bergen.
Food. 'Round World.—Foodstuffs 'Round the World. Fishery News. Department of Commerce. Washington.
Forest Stream.—Forest and Stream. New York.
Förh. Svenska VetAkad.—Förhandlingar, Öfversigt af . . . Svenska Vetenskapsakademien. Stockholm.
Forh. VidSelsk. Kristiania.—Forhandlinger i Videnskabselskabet i Kristiania.
Forh. VidSelsk. Oslo.—Forhandlinger. Videnskabs-Selskab. Oslo.

G

- Gaz. Italia.—Gazzetta d'Italia. Firenze.

H

- Handb. Roy. Zool. Soc. New South Wales.—Handbook. Royal Zoological Society of New South Wales. Sydney.
Handb. Ser. American Mus.—Handbook Series. American Museum of Natural History. New York.
Handl. Göteborgs VetSamh.—Handlingar, Nya. Göteborgs Kungl. Vetenskaps-Vitterhetssamhalles. Göteborg.

I

- Ind. Française Cons.—L'Industrie Française de la Conserve. Paris.
Intern. Fish. Exhib. Lit.—International Fisheries Exhibition Literature. London.
Intern. Fishery Cong.—Congresso Internazionale di Pesca. (International Fishery Congress.)
Intern. Revue Hydrobiol. Hydrogr.—Internationale Revue der Gesamten Hydrobiologie und Hydrographie. Leipzig.
Irish Naturalist. Dublin.
Iris.—Revue Consacrée à l'Histoire de la Science. Bruxelles.

J

- Jahrb. Class. Phil.—Jahrbücher für Classische Philologie.
Jahresber. Deutsche Fisch.—Jahresbericht über die Deutschen Fischerei.
Jahresber. Wiss. Meeresuntersuch.—Jahresbericht Wissenschaftliche Meeresuntersuchungen. (Biologische Anstalt auf Helgoland; Kommission zur Wissenschaftlichen Untersuchung der Deutschen Meere in Kiel.) Berlin.
Journ. Biol. Chem.—Journal of Biological Chemistry. New York.
Journ. Bombay Nat. Hist. Soc.—Journal of the Bombay Natural History Society. Bombay.
Journ. Coll. Agric. Tokyo.—Journal of the College of Agriculture. Tokyo (Hokkaido) Imperial University. Sapporo.
Journ. Coll. Sci. Tokyo.—Journal of the College of Science. Imperial University of Tokyo. Tokyo.
Journ. Conseil.—Journal du Conseil. Conseil Permanent International pour l'Exploration de la Mer. Copenhagen.
Journ. Imp. Fish. Bur. Tokyo.—Journal of the Imperial Fisheries Bureau. Tokyo.
Journ. Mar. Biol. Assoc.—Journal of the Marine Biological Association of the United Kingdom. Plymouth.
Journ. Morph.—Journal of Morphology. Boston.
Journ. Mus. Godeffroy.—Journal des Museum Godeffroy. Hamburg.

Journ. Pan-Pacific Res. Instn.—Journal of the Pan-Pacific Research Institution. Honolulu.

Journ. Roy. Asiatic Soc.—Journal of the Royal Asiatic Society. London.

L

Lettura.—Revista Mensile Del Corriere della Sera. Milano.

M

Mem. Acad. R. Belgique.—Mémoires. Académie Royale de Belgique. Classe des Sciences. Série II. Bruxelles. *Formerly* Mémoires de l'Académie Royale des Sciences, des Lettres et des Beaux-arts de Belgique. Bruxelles.

Mem. Accad. Lincei.—Memorie. Atti della R. Accademia Nazionale dei Lincei. Classe di scienze fisiche, matematiche e naturali. Roma.

Mem. American Acad. Arts Sci. Boston.—Memoirs of the American Academy of Arts and Sciences. Boston.

Mem. California Acad. Sci.—Memoirs. California Academy of Sciences. San Francisco.

Mem. Carnegie Mus.—Memoirs of the Carnegie Museum. Pittsburgh.

Mem. Ser. U. S. Bur. Fish.—Memorandum Series. United States Bureau of Fisheries. Washington.

Mém. (Sér. Spéc.) Off. Pêch. Marit.—Mémoires. (Série Spéciale.) Office Scientifique et Technique des Pêches Maritimes. Paris.

Mem. Soc. Hist. Nat. Paris.—Mémoires. Société d'Histoire Naturelle de Paris. Paris.

Mem. Talasso. Italiano.—Memoria. R. Comitato Talassografico Italiano. Venezia.

Merc. Trust Rev.—Mercantile Trust Review. San Francisco.

Miss. Italiana Esplor. Levante.—Missione Italiana per l'Esplorazione dei Mari di Levante. Venezia.

Mitt. Deutsch. SeefischVer.—Mitteilungen des Deutschen Seefischereivereins. Berlin.

N

Nat. Geneesk. Arch. Neêrland's-Indië.—Natuur- en Geneeskundig Archief voor Neêrland's-Indië. Batavia.

Nat. Geogr. Mag.—National Geographic Magazine. Washington.

Nat. Hist.—Natural History. American Museum of Natural History. New York.

Nat. Tijdschr. Nederlandsch-Indië.—Natuurkundig Tijdschrift voor Nederlandsch-Indië. Batavia.

NatHist. Tidsskr.—Naturhistorisk Tidsskrift. Kjøbenhavn.

Natura.—Milano.

Nederlandsch Tijdschr. Dierk.—Nederlandsch Tijdschrift voor de Dierkunde. (K. Zoologisch Genootschap Natura Artis Magistra.) Amsterdam.

Neptunia. Venezia.

Neu. Jahrb. Mineral.—Neues Jahrbuch für Mineralogie, Geologie, und Paleontologie. Stuttgart.

New Zealand Journ. Sci. Tech.—New Zealand Journal of Science and Technology. Wellington.

Norsk FiskTid.—Norsk Fiskeritidende. Kjøbenhavn.

Note Serv. Pêch. Indochine.—Note. Service Océanographique des Pêches de l'Indochine. Station Maritime de Cauda. Saigon.

Notes Off. Pêch. Marit.—Notes et Mémoires. Office Scientifique et Technique des Pêches Maritimes. Paris. *Cont'd as* Notes et Rapports.

Notes Off. Pêch. Marit.—Notes et Rapports. Office Scientifique et Technique des Pêches Maritimes. Paris. *Formerly* Notes et Mémoires. *Cont'd as* Revue des Travaux.

Nya Handlingar. *See* Handlingar, Nya.

Nye Samling. *See* Samling, Nye.

O

Occ. Pap. California Acad. Sci.—Occasional Papers of the California Academy of Sciences. San Francisco.

Öfversigt af . . . Förhandlingar. *See* Förhandlingar, Öfversigt af.

P

- Pacific Fish.—Pacific Fisherman. Seattle.
 Pacific Fish. Yr. Bk.—Pacific Fisherman. Year Book. Seattle. *Cont'd. as Pacific Fisherman. Statistical Number.*
 Pacific Fish. Stat. No.—Pacific Fisherman. Statistical Number. *Formerly Pacific Fisherman. Year Book.*
 Pacific Mot. Boat.—Pacific Motor Boat. Seattle.
 Pacific Sport.—Pacific Sportsman. San Francisco.
 Pêch. Marit.—La Pêche Maritime. Paris.
 Philos. Mag.—Philosophical Magazine. London.
 Policlínico. Roma.
 Pop. Sci. Mon.—Popular Science Monthly. New York.
 Proc. Acad. Nat. Sci. Philadelphia.—Proceedings of the Academy of Natural Sciences of Philadelphia. Philadelphia.
 Proc. Biol. Soc. Washington.—Proceedings of the Biological Society of Washington. Washington.
 Proc. California Acad. Sci.—Proceedings of the California Academy of Sciences. San Francisco.
 Proc. U. S. Nat. Mus.—Proceedings of the United States National Museum. Washington.
 Proc.-Verb. Comm. Explor. Méditerranée.—Rapports et Procès-Verbaux. Commission International pour l'Exploration Scientifique de la Mer Méditerranée. Paris.
 Proc.-Verb. Cons. Explor. Mer.—Rapports et Procès-Verbaux. Conseil Permanent International pour l'Exploration de la Mer. Copenhagen.
 Proc. Verb. Soc. Toscana Sci. Nat.—Processi Verbali della Società Toscana di Scienze Naturali in Pisa. Pisa.
 Proc. Zool. Soc. London.—Proceedings of the General Meetings for Scientific Business of the Zoological Society of London. London.
 Publ. Circ. Cons. Explor. Mer.—Publications de Circonstance. Conseil Permanent International pour l'Exploration de la Mer. Copenhagen.
 Publ. Field. Mus.—Publications. Field Museum of Natural History. Zoological Series. Chicago.

R

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- Jordan and Hubbs, 1925.
- Jordan, Tanaka and Snyder, 1913.
- Kitahara, 1897.

Mediterranean

- Cuvier and Valenciennes, 1831.
- Rafinesque-Schmaltz, 1810.1.
- Risso, 1810, 1826.

New Zealand

- Griffin, 1927.
- Phillips and Hodgkinson, 1922.

North America, Atlantic Coast

- Goode, 1903.
- Jordan and Evermann, 1896.1, 1896.2.
- Jordan and Gilbert, 1883.
- Nichols, 1920, 1922.
- Nichols and Breder, 1927.
- Nichols and Gregory, 1918.
- Sumner, Osburn and Cole, 1913.

North America, Pacific Coast

- Cooper, 1863.
- Eigenmann, 1892.
- Eigenmann, C. H. and R. S., 1892.
- Holder, 1912, 1914.
- Hubbs, 1928.
- Jordan, 1885.
- Jordan and Gilbert, 1880.2, 1882.
- Jordan and Jouy, 1882.
- Metz, 1912.
- Starks and Morris, 1907.

Panama Bay

- Gilbert and Starks, 1904.

Portugal

- Seabra, 1911.

St. Helena

- Cunningham, 1910.

South Sea

- Günther, 1876.

West Indies

- Jordan, 1887.

Reproduction

- Day, 1880.
- Devedjian, 1926.
- Ehrenbaum, 1924.
- Gruvel and Conseil, 1925.
- Scofield, N. B., 1914.

Season for fishing in Mediterranean

- Roule, 1914.1.

Statistics, Japan

- Nakamura and Ourakami, 1900.

Synonymy

- Barnard, 1927.
- Boulenger, 1892.
- Carus, 1893.

GERMO ALALUNGA—Continued.

Synonymy—Continued.

- Collett, 1896.
Couch, 1862.
Day, 1880.
Fowler, 1904.
Günther, 1860, 1876.
Jordan and Evermann, 1905.
Jordan and Gilbert, 1882, 1883.
Jordan, Tanaka and Snyder, 1913.
Kishinouye, 1923.
La Blanchère, 1868.
Lowe, 1839.
Meek and Hildebrand, 1923.
Metzelaar, 1919.
Moreau, 1881.
Ninni, A. P., 1882.
Parona, 1919.
White, 1851.

Temperature and vertebrae
Jordan, 1892.

Temperature of fish
Portier, 1903.
Zirino, 1908.

Young stages described
Ehrenbaum, 1924.
Fries, Ekstrom and Sundevall, 1893.
Lütken, 1880.
Sanzo, 1910.2, 1925.
Sella, 1924.

GERMO ALLISONI. See *Neothunnus allisoni*.

GERMO ARGENTIVITTATUS. See *Neothunnus argentivittatus*.

GERMO GERMO See *Germo alalunga*.

GERMO MACROPTERUS. See *Neothunnus macropterus*.

GERMO MACULATA

Recorded from
Southern California
Holder, 1914.

GERMON. See also *Germo alalunga*.

Anatomy of eye
Moreau, 1872.

Expeditions
Belloc, 1927.1, 1927.2.
Péch. Marit., 1927.4.

Fishery in France
Roché and Odin, 1893.

Fishery in Mediterranean
Le Danois, 1923.1.

Food
Belloc, 1927.2, 1927.4.
Le Danois, 1921.2, 1921.3, 1922,
1923.1, 1923.2.

Migrations
Belloc, 1927.2.
Le Danois, 1921.2, 1921.3, 1922,
1923.2, 1924, 1928.
Le Danois and Belloc, 1923.
Péch. Marit., 1925.4.

Reproduction
Péch. Marit., 1925.4.

GERMON—Continued.

Temperature

- Belloc, 1927.2.
Le Danois, 1921.2, 1921.3, 1922,
1923.1, 1923.2.

GERMO SIBI. See *Parathunnus sibi*.

GROWTH AND DEVELOPMENT

- Bean, 1903.
Gourret, 1894.1.
Heldt, 1926, 1927.2, 1928.1, 1928.2.
Kishinouye, 1926.
Lütken, 1880.
Raveret-Wattel, 1909.
Sella, 1929.
Tracy, 1910.

GYMNOSARDA ALLETTERATA. See
Euthynnus alletteratus.

GYMNOSARDA PELAMIS. See *Euthynnus pelamis*.

H

HABITAT

Germón or albacore
Belloc, 1927.2.
Fish. Gaz., 1918.
Roule, 1922.

Thon
Dumont, 1927.
Roule, 1917.2, 1922.
Sella, 1929.

Tuna
Richardson, 1845.

Thynnus affinis
Cantor, 1850.

HABITS

- Adams, 1883.
Aristotle, 1897.
Bigelow, 1925.
Buen, O., 1924.2.
Carlos de Bragança, 1899.
Elianus, 1744.
Espow, 1928.
Giovio, 1524.
Ionstoni, 1767.
Jordan, 1925.1.
Jordan and Evermann, 1914.
Kyle, 1926.
La Blanchère, 1868.
Marchand, 1926.
Meehan, 1919.
Oppianus, 1928.
Pliny, 1601.
Raveret-Wattel, 1909.
Rondelet, 1554.

HYDROGRAPHIC CONDITIONS AFFECTING MIGRATIONS. See also
Tropisms.

Atún or tuna

- Bol. Pescas, 1924.2.
Bounhiol, 1911.2, 1911.4.
Buen, O., 1924.2.
Dumont, 1927.
Hovasse, 1927.
Kochi Fishery Exp. Sta., 1927.
Le Gall, 1927.1, 1927.2, 1929.
Marchand, 1926.
Marion, 1894, 1897.
Parona, 1919.

HYDROGRAPHIC CONDITIONS—Cont.

Atún or tuna—Continued.

- Péch. Marit., 1926.2, 1927.3.
Roule, 1914.2, 1916.1, 1918, 1919, 1921,
1922, 1926.2, 1929.
Scordia, 1925, 1928.

Germon or albacore

- Belloc, 1927.1, 1927.2, 1927.3.
Bol. Pescas, 1922.1.
Le Danois, 1921.2, 1921.3, 1922, 1923.1,
1923.2, 1924, 1928.
Le Danois and Belloc, 1923.
Somigli, 1912.

I

IODINE CONTENT

- Tressler and Wells, 1925.
Wells, 1925.

K

KATSUWONUS PELAMIS. See *Euthynus pelamis*.

KATSUWONUS VAGANS. See *Euthynus pelamis*.

KEYS

- Delphy, 1916.
Dumeril, 1856.
Jenkins, 1925.
Jordan and Evermann, 1896.1, 1926.2.
Jordan and Gilbert, 1883.
Kishinouye, 1923.
Moreau, 1892.

KISHINOELLA RARA

Anatomy

- Kishinouye, 1923.

Classification

- Kishinouye, 1923.

Common names, Japanese

- Kishinouye, 1923.

Description

- Jordan and Evermann, 1926.2.
Jordan and Hubbs, 1925.
Kishinouye, 1923.

Distribution

- Jordan and Evermann, 1926.2.

Keys

- Jordan and Evermann, 1926.2.
Kishinouye, 1923.

Recorded from

- Hawaii
Jordan and Evermann, 1926.1.
Japan
Jordan and Hubbs, 1925.

Synonymy

- Kishinouye, 1923.

KISHINOELLA ZACALLES

Description

- Jordan and Evermann, 1926.2.

Distribution

- Jordan and Evermann, 1926.2.

Figured

- Jordan and Evermann, 1926.2.

Keys

- Jordan and Evermann, 1926.2.

L

LARVA AND YOUNG STAGES. See Young.

LAWS REGULATING FISHERY

California

- Pacific Fish., 1924.

Anglers' license

- Hedderly, 1916.
Shaeffle, 1914.

France

- Gourret, 1894.4.
Turrel, 1872, 1875.

Italy

- Carlier y Vivora, 1908.
Giglioli, 1905.
Mussolini and Belluzzo, 1927.
Norsk FiskTid., 1927.3.
Ossada, 1816.
Parona, 1919.
Polidor, J., 1912.

Mediterranean

- Cuvier and Valenciennes, 1831.

Portugal

- Bol. Pescas, 1924.4.
Silva, 1898.

Sardinia

- Brault, 1893.

Sicily

- Avolio, 1805.

Spain

- Bol. Pescas, 1917, 1924.3, 1925.1,
1925.6, 1926.1, 1926.9, 1927.2,
1927.5, 1928.1, 1928.3.
Miranda y Rivera, 1927.
Salas and García Solá, 1876.
Santamaria, 1923.

Tunis

- Bourge, 1914.
Wolf from, 1903.

LITIGATION

France

- Turrel, 1875.

Italy

- Anonymous, 1905.
Levi-Morenos, 1899.
Parona, 1915, 1919.
Roule and Thoulet, 1912.

Sardinia

- Parona, 1915.

M

MADRAGUE

- Bounhiol, 1911.2.
Brault, 1893.
Buen, F., 1927.1.
Devedjian, 1926.
Goode, 1903.
Gourret, 1894.4.
Meunier, 1868.
Polidor, M., 1908.
Raveret-Wattel, 1909.
Rhode, 1890.
Ruschenberger, 1844.
Turrel, 1872, 1875, 1877.

MIGRATIONS

- Amico, 1816.
 Athanassopoulos, 1923, 1924, 1926, 1927.
 Bean, 1903.
 Belloc, 1927.1, 1927.2, 1927.3.
 Bol. Pescas, 1924.1, 1924.2, 1927.3.
 Bonnard, 1902.
 Bounhiol, 1911.1, 1911.2, 1911.3, 1911.4.
 Bourge, 1915.
 Buen, F., 1922, 1924, 1927.1, 1927.2.
 Buen, O., 1924.1, 1924.2.
 Bullen, 1904.
 California Fish Game, 1914.1, 1925.
 Callioni, 1887.
 Carlier y Vivora, 1908.
 Carlos de Bragança, 1899.
 Cobb, 1919.2.
 Couch, 1862.
 Cuvier and Valenciennes, 1831.
 D'Ancona, 1927.
 Daniel, 1925.
 Day, 1880.
 Devedjian, 1926.
 Duge, 1926.
 Dumont, 1927.
 Ehrenbaum, 1924.
 Elliott, 1922.
 Esipow, 1928.
 Faber, 1883.
 Fages and Ponzevera, 1908.
 Fish Oyster Reptr., 1923.
 Fish Gaz., 1918, 1927.
 Floericke, 1923.
 Fries, Ekstrom and Sundevall, 1893.
 Giacomini, 1926.
 Goode, 1884, 1903.
 Giovio, 1524.
 Gruvel, 1926.1.
 Heldt, 1923, 1926, 1927.1, 1927.3, 1928.1,
 1928.2, 1929.
 Holder and Jordan, 1909.
 Hovasse, 1927.
 Hulit, 1924.
 Kyle, 1926.
 Le Danois, 1921.2, 1921.3, 1922, 1923.2,
 1924, 1928.
 Le Danois and Belloc, 1923.
 Le Gall, 1929.
 McIntosh, 1921.
 Marchand, 1926.
 Meek, 1916.
 Mitt. Deutsch. SeefischVer., 1927.
 Nascimento, 1928.
 Navarro, 1928.
 Niewenglowski, 1913.
 Ninni, E., 1921.2, 1922, 1923.
 Niigata Fishery Exp. Sta., 1927.
 Ossada, 1816.
 Parona, 1919.
 Pêch. Marit., 1924.3, 1924.5, 1925.2,
 1925.4, 1926.3, 1927.2, 1927.3,
 1928.1, 1928.2.
 Raveret-Wattel, 1909.
 Rhode, 1890.
 Risso, 1826.
 Roché and Odin, 1893.
 Roule, 1913.1, 1913.2, 1914.2, 1914.3,
 1916.2, 1917.1, 1917.2, 1918, 1919,
 1921, 1922, 1924.2, 1925, 1926.2,
 1929.
 Salas and García Solá, 1876.
 Santamaria, 1923.
 Sanzo, 1910.1.
 Scofield, N. B., 1914.

MIGRATIONS—Continued.

- Sella, 1926.1, 1926.2, 1927.1, 1927.2, 1929.
 Silva, 1898.
 Somigli, 1912.
 Steuer, 1927.
 Strabo, 1892.
 Willughby, 1686.

MINING AND TUNA INDUSTRY, LITIGATION BETWEEN. See Litigation.

MUSEUM SPECIMENS

In American Museum of Natural History

La Monte, 1928.

In British Museum

Lankester, 1908.

In France

Roule, 1927.

N

NEOTHUNNUS

New species listed

Jordan and Evermann, 1926.1.

NEOTHUNNUS ALBACORES

Anatomy

Frade, 1929.

Description

Frade, 1929.

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

Keys

Jordan and Evermann, 1926.2.

NEOTHUNNUS ALLISONI

Compared with *Thunnus thynnus*

Mowbray, 1920.

Description

Breder, 1929.

Jordan and Evermann, 1926.2.

Distribution

Breder, 1929.

Jordan and Evermann, 1926.2.

Figured

Breder, 1929.

Jordan and Evermann, 1926.2.

Keys

Breder, 1929.

Jordan and Evermann, 1926.2.

Recorded from North America, east coast

Mowbray, 1920.

Nichols, 1925.

NEOTHUNNUS ARGENTIVITTATUS

Coloration

Nichols and Murphy, 1922.

Common names of Peru

Nichols and Murphy, 1922.

Description

Günther, 1860.

Jordan and Jordan, 1922.

Nichols and Murphy, 1922.

South, 1845.

NEOTHUNNUS ARGENTIVITTATUS—
Continued.

Distribution

Günther, 1860.
South, 1845.

Recorded from

Hawaii

Jordan and Jordan, 1922.

Mediterranean

Cuvier and Valenciennes, 1831.

North America, east coast

Goode, 1903.

Peru

Murphy, 1923.

Nichols and Murphy, 1922.

Synonymy

Günther, 1860.

NEOTHUNNUS CATALINAE

Common names

Craig, 1929.

Description

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

Figured

Jordan and Evermann, 1926.2.

Keyes

Jordan and Evermann, 1926.2.

NEOTHUNNUS ITOSIBI

Anatomy

Frade, 1929.

Description

Frade, 1929.

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

Figured

Jordan and Evermann, 1926.2.

Keys

Jordan and Evermann, 1926.2.

NEOTHUNNUS MACROPTERUS

Anatomy

Kishinouye, 1923.

Canning

Cobb, 1919.1.

Elliott, 1922, 1923, 1924.

Pacific Fish. Stat. No. 1927.1, 1928.1.

Serv. Reg. Announc., 1920.

Chemical analysis

Dill, 1921.1.

Classification

Kishinouye, 1923.

Color

Starks and Morris, 1907.

Common names

Kishinouye, 1923.

Description

Atco Fish News, 1926.

Day, 1878, 1889.

Elliott, 1922, 1923, 1924.

Holder, 1907.

Jordan, 1925.2.

Jordan and Evermann, 1926.2.

NEOTHUNNUS MACROPTERUS—Cont.

Description—Continued.

Jordan and Hubbs, 1925.

Jordan and Jordan, 1922.

Jordan and Starks, 1907.

Kishinouye, 1923.

Pacific Fish. Stat. No. 1927.1, 1928.1.

Starks, 1918.1.

Temminck and Schlegel, 1850.

Thompson, W. F., 1919.2.

Distribution

Day, 1889.

Holder, 1912.

Jordan, 1925.1.

Jordan and Evermann, 1926.2.

Jordan, Tanaka and Snyder, 1913.

Starks, 1918.1.

Temminck and Schlegel, 1850.

Ulrey and Greeley, 1928.

Figured

Elliott, 1922, 1923, 1924.

Jordan, 1925.2.

Jordan and Evermann, 1926.2.

Jordan and Starks, 1907.

Kitahara, 1897.

Starks, 1918.1.

Temminck and Schlegel, 1850.

Fishery in Lower California

Coleman, 1923.

Habitat

Day, 1878.

Richardson, 1845.

Keys

Jordan and Evermann, 1926.2.

Kishinouye, 1923.

Migrations

Elliott, 1922.

Recorded from

British Isles

Thompson, W., 1861.

California

Hubbs, 1916.

Jordan, 1906.

Jordan and Starks, 1907.

Dutch East Indies

Bleeker, 1852, 1862.

Hawaii

Jordan and Evermann, 1926.1.

Jordan and Jordan, 1922.

Japan

Jordan and Hubbs, 1925.

Jordan, Tanaka and Snyder, 1913.

Kitahara, 1897.

Richardson, 1845.

Temminck and Schlegel, 1850.

North America, west coast

Holder, 1907, 1912.

Red Sea

Klunzinger, 1884.

Season in California

Scofield, N. B., 1919.

Synonymy

Day, 1878, 1889.

Jordan and Starks, 1907.

Jordan, Tanaka and Snyder, 1913.

Kishinouye, 1923.

Richardson, 1845.

NEOTHUNNUS RARUS. See

Kishinoella rara.

NEOTHUNNUS TONGGOL

Description

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

Keys

Jordan and Evermann, 1926.2.

NOMENCLATURE

Gill, 1888, 1894.

Jordan, 1888.

O

ORCYNUS. See *Thunnus*

ORCYNUS ALALONGA. See *Germo alalunga*.

ORCYNUS ALBACORA. See *Germo alalunga*.

ORCYNUS ALLITERATUS. See *Euthynnus alletteratus*.

ORCYNUS BALTEATUS. See *Thunnus balteatus*.

ORCYNUS GERMO. See *Germo alalunga*.

ORCYNUS KOMPOSCHI

Fossils from upper Oligocene, Austria
Woodward, 1901.

ORCYNUS LANCEOLATUS. See *Thunnus lanceolatus*.

ORCYNUS LATIOR. See *Thunnus latior*.

ORCYNUS MEDIUS.

Fossils from Lower Miocene, Italy
Woodward, 1901.

ORCYNUS PACIFICUS. See *Germo alalunga*.

ORCYNUS PELAMYS. See *Euthynnus pelamis*.

ORCYNUS RONDEL

Description

Aldrovandi, 1613.

Distribution

Aldrovandi, 1613.

Figured

Aldrovandi, 1613.

Natural history

Aldrovandi, 1613.

Synonymy

Aldrovandi, 1613.

ORCYNUS SECUNDI-DORSALIS. See
Thunnus secundodorsalis

ORCYNUS SUBULATUS. See *Thunnus subulatus*.

ORCYNUS THUNNINA. See *Euthynnus alletteratus*.

ORYCNUS

thynnus.

ORCYNUS

Classification

Jordan, 1923.1.

Nomenclature

Gill, 1888.

P

PARASITES

Aristotle, 1897.

Beneden, 1871.

Brian, 1901, 1912.

Cunningham, 1893.

Cuvier and Valenciennes, 1831.

Harada, 1928.

Lacépède, 1829.

Linton, 1901.

Miculicich, 1905.1, 1905.2.

Moulé, 1908.

Parona, 1919.

Pernetty, 1770.

Stossich, 1902, 1904.

Sumner, Osburn and Cole, 1913.

PARATHUNNUS MEBACHI

Anatomy

Kishinouye, 1923.

Classification

Kishinouye, 1923.

Common names, Japanese

Kishinouye, 1923.

Description

Kishinouye, 1923.

Keys

Kishinouye, 1923.

Synonymy

Kishinouye, 1923.

PARATHUNNUS OBESUS

Anatomy

Frade, 1927.1.

Common names

Frade, 1927.1.

Description

Frade, 1929.

Günther, 1860.

Jordan and Evermann, 1926.2.

Lowe, 1839.

Distribution

Günther, 1860.

Jordan and Evermann, 1926.2.

Figured

Cunningham, 1910.

Keys

Jordan and Evermann, 1926.2.

Recorded from St. Helena

Cunningham, 1910.

Synonymy

Günther, 1860.

Lowe, 1839.

PARATHUNNUS SIBI

Canning in Japan

Nakamura and Ourakami, 1900.

Color

Fowler, 1927.

Description

Fowler, 1927.

Günther, 1860.

Jordan, 1925.2.

Jordan and Evermann, 1926.2.

Jordan and Hubbs, 1925.

Temminck and Schlegel, 1850.

PARATHUNNUS SIBI—Continued.

Distribution

Günther, 1860.
Jordan and Evermann, 1926.2.
Temminck and Schlegel, 1850.
Ulrey and Greeley, 1928.

Figured

Fowler, 1927.
Jordan, 1925.2.
Jordan and Evermann, 1926.2.
Kitahara, 1897.
Temminck and Schlegel, 1850.

Habitat

Richardson, 1845.

Keys

Jordan and Evermann, 1926.2.

Recorded from

Hawaii

Jordan and Evermann, 1926.1.
Snyder, 1904.

Japan

Bleeker, 1879.
Jordan and Hubbs, 1925.
Kitahara, 1897.
Richardson, 1845.
Temminck and Schlegel, 1850.

Pacific, Central

Fowler, 1927.

Statistics, Japan

Nakamura and Ourakami, 1900.

Synonymy

Günther, 1860.
Richardson, 1845.

PELAMYS MACROPTERUS. See *Neothunnus macropterus*.

PELAMYS PELAMYS. See *Euthynnus pelamis*.

PELAMYS SARDA. See *Sarda sarda*.

PELAMYS SIBI. See *Parathunnus sibi*.

PELAMYS THUNNINUS. See *Euthynnus alletteratus*.

PELAMYS THYNNUS. See *Thunnus thynnus*.

POISONING CAUSED BY TUNA

Bachieri, 1907.
Bassett-Smith, 1903.
Galiay, 1845.
Henderson, 1830.
Lardier, 1891.
Lussana, 1894.
Maccacci, 1891, 1893.
Monti, N., 1910.
Pagnoni, 1894.
Pergola, 1912.
Pergola and Collodi, 1910.
Tenison-Woods, 1882.
Teyxeira, 1910.
Tybring, 1887.

Remedy

Mattioli, 1704.

PRESERVATION METHODS

Aldrovandi, 1613.
Bellón Uriarte, 1926.2.
Buen, F., 1922, 1928.
Calapaj, 1927.
Cuvier and Valenciennes, 1831.

PRESERVATION METHODS—Cont.

Devedjian, 1926.
Dollfus, 1927.
Grandbesançon, 1909.
Gruvel, 1926.1.
Keller, 1913.
Lacépède, 1829.
Leca, 1911.
Nakamura and Ourakami, 1909.
Parona, 1919.
Rhode, 1890.
Simmonds, 1879.
Smidth, 1876.
Tressler, 1923.
Tristan, 1925.
Verdier, 1929.

PROPORTIONAL MEASUREMENTS

Germo germo

Clark, 1929.

Neothunnus albacora

Frade, 1929.

Neothunnus itosibi

Frade, 1929.

Parathunnus obesus

Frade, 1929.

Thunnus thynnus

Heldt, 1927.2, 1928.1, 1928.2, 1929.
Roule, 1926.1.
Sella, 1924.

R

RACES

Germo germo

Clark, 1929.

Thunnus thynnus

Heldt, 1927.2, 1928.2, 1929.1, 1929.2.
Péch. Marit., 1928.4.
Roule, 1926.1.

RECIPES FOR PREPARING AS FOOD

Ancient

Apicius, 1542.
Rhode, 1890.

Modern

Spencer and Cobb, 1921.

REFRIGERATION ON TUNA BOATS

Barnhill, 1928.
Cave, 1928.3.
Frigor, 1928.
Pacific Fish., 1926, 1927.3.
Péch. Marit., 1924.4.

REPRODUCTION

Aristotle, 1897.
Barnhart, 1927.
Bol. Pescas, 1927.3.
Buen, F., 1924, 1925, 1927.1, 1927.2.
Buen, O., 1924.2.
Bullen, 1904.
Canadian Fish., 1922.
Carlier y Vivora, 1908.
Cuvier and Valenciennes, 1831.
Day, 1880.
Ehrenbaum, 1924.
Floericke, 1923.
Fries, Ekstrom and Sundevall, 1893.
Goode, 1884.
Gruvel and Conseil, 1925.
Heldt, 1926, 1928.1.

REPRODUCTION—Continued.

- Hovasse, 1927.
Ninni, E., 1921.2.
Oppianus, 1928.
Parona, 1919.
Péch. Marit., 1925.2, 1925.4, 1926.4,
1928.1.
Rhode, 1890.
Roule, 1913.1, 1914.2, 1917.1, 1929.
Sanzo, 1910.1, 1910.2, 1925, 1929.
Scofield, N. B., 1914.
Sella, 1929.
Skogsberg, 1925.
Somigli, 1912.
Valentini, 1895.
Yarrell, 1836.

S

SALINITY. See Hydrographic conditions.

SALTING. See Preservation methods.

SARDA CHILIENSIS

- Canned as tuna**
Pacific Fish. Stat. No. 1928.1.
Serv. Reg. Announc., 1920.

Chemical analysis
Dill, 1921.1.

Common names
Craig, 1929.

Description
Pacific Fish. Stat. No. 1928.1.

Distribution
Ulrey and Greeley, 1928.

Nomenclature
Craig, 1929.

Spawning season
Barnhart, 1927.

SARDA PELAMITUS. See *Sarda sarda*.

SARDA SARDA

Anatomy
Lacépède, 1829.

Common names
Parona, 1919.

Description
Breder, 1929.
Caraffa, 1902.
Jenkins, 1925.
Lacépède, 1829.
Parona, 1919.
Risso, 1826.

Distribution
Breder, 1929.
Jenkins, 1925.
Parona, 1919.
Tracy, 1907.

Figured
Breder, 1929.
Jenkins, 1925.
Parona, 1919.

Habits
Tracy, 1907.

Keys
Breder, 1929.
Jenkins, 1925.

Larvae described and figured
Parona, 1919.
Sanzo, 1910.2

SARDA SARDA—Continued.

Migrations
Jenkins, 1925.
Risso, 1826.

Recorded from
British Waters
Jenkins, 1925.

Mediterranean
Rafinesque-Schmaltz, 1810.1.
Risso, 1826.

United States, east coast
Goode, 1879.

Synonymy
Parona, 1919.

*So. Africa
Biden 1930*

SARDA VELOX

Description
Breder, 1929.

Distribution
Breder, 1929.

Figured
Breder, 1929.

Keys
Breder, 1929.

SCIENTIFIC RESEARCH

France
Buen, O., 1924.3.
Le Danois, 1928.
Péch. Marit., 1923.2.
Volterra, 1923.

Italy
Mitt. Deutsch. SeefischVer., 1927.
Norsk FiskTid., 1927.2.
Parona, 1912.
Péch. Marit., 1926.3.
Russo, 1913.
Sella, 1912.2, 1926.1, 1926.2, 1927.

Portugal
Carlos de Bragança, 1899.

Spain
Buen, F., 1925.

United States
Atlantic Coast
Fish. Gaz., 1927.
California
California Fish Game, 1918.
Cobb, 1919.2.
Scofield, N. B., 1918, 1922.1.
Thompson, W. F., 1920.1, 1920.2,
1924.

SCOMBER

Nomenclature
Jordan, 1888.

SCOMBER ALALONGA. See *Germo alalunga*.

SCOMBER ALBACORES. See *Neothunnus albacores*.

SCOMBER ALLETTERATUS. See *Euthynnus alletteratus*.

SCOMBER BISUS

Recorded from Sicily
Rafinesque-Schmaltz, 1810.1.

SCOMBER BRACHYPTERUS. See *Thunnus brachypterus*.

SCOMBER COLIAS

Recorded from Sicily

Rafinesque-Schmaltz, 1810.1.

SCOMBER GERMO. See *Germo alalunga*.

SCOMBER LAROCHE

Description

Risso, 1810.

Recorded from Mediterranean

Risso, 1810.

SCOMBER PELAMIS. See *Euthynnus pelamis*

SCOMBER PELAMYS. See *Euthynnus pelamis*.

SCOMBER SARDA. See *Sarda sarda*.

SCOMBER THUNINA. See *Euthynnus alletteratus*.

SCOMBER THYNNUS. See *Thunnus thynnus*.

SERIOLA DORSALIS

Canned as tuna

Pacific Fish. Stat. No., 1928.1.

Serv. Reg. Announc., 1920.

SPAWNING. See Reproduction.

STATISTICS

Adriatic, east coast

Marchesetti, 1882.

California

California Div. Fish Game, 1919.2, 1927, 1928.

Conner, 1929, 1930.

Crocker, 1929.

Scofield, N. B., 1922.2, 1925.

Scofield, W. L., 1925, 1929.1.

Sette, 1925, 1926, 1927.

Taylor, 1924.

Tressler, 1923.

West Coast Fish. 1929.5.

Whitehead, 1929.1.

Ceylon

Malpas, 1929.

France

Bull. U. S. Fish. Comm., 1886.

Gourret, 1889, 1894.1, 1894.2, 1894.3, 1897.

Grandbesançon, 1909.

Lemy, 1901.

Notes Off. Pêch. Marit., 1925, 1926.1, 1926.2, 1927.

Revue Marit., 1893.

Revue Trav. Off. Pêch. Marit., 1928.1, 1928.2.

Roule, 1914.3.

Italy

Parona, 1919.

Simmonds, 1879.

Somigli, 1912.

STATISTICS—Continued.

Japan

Nakamura and Ourakami, 1900.

Sec. Stat. Dept. Agric. Comm., 1922, 1925.

Sec. Stat. Dept. Agric. For., 1926.1, 1926.2.

Spec. Cat. Imp. Fish. Bur., 1904.

Mediterranean

Aubertin, 1909.1, 1909.2.

Morocco

Marchand, 1926.

Norway

Hanson, 1927.

Portugal

Leach, 1928.

Minist. Mar. Lisboa, 1925, 1926, 1927.1, 1927.2, 1927.3.

Neuparth, 1925.

Sicily

Nathan and Cruger, 1924.

Spain

Anuario Estadístico, 1915.

Bellón Uriarte, 1926.2.

Bol. Pesca, 1926.10, 1928.2.

Buen, F., 1920, 1922, 1925, 1927.1.

Buen, O., 1923.

Carandell, 1924.

Delgado, 1921.

Franco y Salinas, 1923.

Lléo, 1923.

Minist. Mar. Madrid, 1923.

Navarro, 1928.

Tripolitania

Boll. Pesca Piscicult. Idrobiol., 1929.

Tunis

Bourge, 1914.

Durando, 1887.

Fages and Ponzevera, 1908.

Monconduit, 1927.

Roule, 1924.2.

United States

Boll. Pesca Piscicult. Idrobiol., 1927.

California Fish Game, 1919.2, 1920.2.

Radcliffe, 1922, 1923.

U. S. Tariff Comm., 1929.

SYNONYMY

Ionstoni, 1767.

T

TARIFF REGULATIONS

Italy

Anonymous, 1883.2, 1887.

Premi, 1884.

TEMPERATURE OF FISH

Davy, 1835.

Hanson, 1929.

Portier, 1903.

Schnackenberg, 1929.2.

Zirino, 1908.

TEMPERATURE IN RELATION TO CATCH

California Fish Game, 1917.

Thompson, W. F., 1917.

**TEMPERATURE IN RELATION TO
MIGRATIONS**

Atún or tuna

- Bol. Pescas, 1924.2.
- Bounhiol, 1911.2.
- Buen, F., 1924.
- Buen, O., 1924.2.
- Le Gall, 1927.1.
- Parona, 1919.
- Roule, 1916.1, 1918, 1919, 1921, 1922,
1926.2.
- Somigli, 1912.

Germon or albacore

- Belloc, 1927.1, 1927.2, 1927.3.
- Bol. Pescas, 1922.1.
- Le Danois, 1921.2, 1921.3, 1922,
1923.2.
- Roule, 1919, 1922.

TEMPERATURE AND VERTEBRAE
Jordan, 1892.

THON. See also *Thunnus thynnus*.

Anatomy of swim bladder
Malm, 1877.

Description
Goüan, 1770.
Rondelet, 1558.

Figured
Rondelet, 1558.

Food
Gourret, 1894.1.

Growth
Gourret, 1894.1.

Migration
Péch. Marit., 1927.2, 1928.1.

Reproduction
Péch. Marit., 1926.4, 1928.1.

Statistics
Gourret, 1894.1, 1894.2, 1894.3.

THUNNUS

Anatomy
Bridge, 1904.
Kölliker, 1859.
Lütken, 1880.
Regan, 1909.

Classification
Jordan, 1923.1.
Regan, 1909.
Swainson, 1839.

Common names
Salviano, 1554.

Description
Artedi, 1738.
Belon, 1553.
Bloch and Schneider, 1801.
Cuvier, 1884.
Dumeril, 1856.
Linnaeus, 1764.
Salviano, 1554.
Swainson, 1839.

Distribution
Bloch and Schneider, 1801.
Cuvier, 1884.
Salviano, 1554.

THUNNUS—Continued.

Fossils from

- Croatia, Tertiary
Kramberger-Gorjanovic, 1882.
- Italy, Tertiary
Bosniaski, 1879.
Rivière, 1886.
- Sardinia, Miocene
Bassani, 1891.

Growth
Lütken, 1880.

Habitat
Linnaeus, 1758.

Habits
Salviano, 1554.

Keys
Dumeril, 1856.

Nomenclature
Gill, 1894.
Jordan, 1888, 1923.1.

Parasites
Moulé, 1908.

Recorded from
Japan
Jordan, 1901.

Java
Bleeker, 1844.

North America, Canadian Coast
Scofield, 1929.2.

References in literature
Artedi, 1738.

Spelling of name
Artedi, 1738.

Synonymy
Dresslar and Fesler, 1889.
Linnaeus, 1758, 1764.

Temperature
Davy, 1835.

THUNNUS AFFINIS. See *Euthynnus alletteratus*.

THUNNUS ALALUNGA. See *Germo alalunga*.

THUNNUS ALBACORA. See *Germo alalunga*.

THUNNUS ALBUI

Fossils from Oligocene of Rumania
Simionescu, 1906.

THUNNUS ALLISONI. See *Neothunnus allisoni*.

THUNNUS ANGUSTUS

Anatomy
Storms, 1889.

Fossils from upper Miocene of Sicily
Woodward, 1901.

THUNNUS ARGENTIVITTATUS. See *Neothunnus argentivittatus*.

THUNNUS ATLANTICUS. See *Germo alalunga*.

THUNNUS AUGUSTUS

Fossils from upper Miocene of Sicily
Sauvage, 1873.

THUNNUS BALTEATUS. See *Germo alalunga*.

THUNNUS BELLONI

Synonymy

Artedi, 1738.

THUNNUS BILINEATUS

Coloration

Klunzinger, 1871.
Rüppel, 1835.

Description

Günther, 1860.
Klunzinger, 1871.
Rüppel, 1835.

Distribution

Günther, 1860.

Figured

Rüppel, 1835.

Food

Klunzinger, 1871.

Synonymy

Günther, 1860.

THUNNUS BOLCENSIS

Description

Agassiz, 1833.
Pictet, 1854.

Fossils from

Italy, early Tertiary

Agassiz, 1833.
Pictet, 1854.

Italy, upper Eocene of Monte Bolca

Eastman, 1911.
Woodward, 1901.

Synonymy

Eastman, 1911.

THUNNUS BRACHYPTERUS. See also *Thunnus thynnus*.

Classification

Ninni, E., 1921.1.

Common names

Moreau, 1881, 1892.
Parona, 1919.

Description

Canestrini, 1870.
Couch, 1862.
Cuvier, 1829, 1884.
Guichenot, 1850.
Günther, 1860.
La Blanchère, 1868.
Moreau, 1881, 1892.
Ninni, A. P., 1882.
Ninni, E., 1921.1.
Parona, 1919.
South, 1845.

Distribution

Cuvier, 1829, 1884.
Guichenot, 1850.
Günther, 1860.
Moreau, 1881.
South, 1845.

Figured

Couch, 1862.
Parona, 1919.

Habits

La Blanchère, 1868.

THUNNUS BRACHYPTERUS—Cont. Keys

Moreau, 1892.

Migrations

Cuvier, 1829.
Pavesi, 1887.

Recorded from

Adriatic

Ninni, A. P., 1882.

Algeria

Bounhiol, 1911.2.
Guichenot, 1850.

British Isles

Couch, 1862.
Cornish, 1868, 1880.

Portugal

Seabra, 1911.

Synonymy

Couch, 1862.
Guichenot, 1850.
Günther, 1860.
La Blanchère, 1868.
Moreau, 1881.
Parona, 1919.

Young described

Sanzo, 1910.1.

THUNNUS BRASILIENSIS. See *Euthynnus alletteratus*.

THUNNUS BREVIPINNIS. See *Euthynnus alletteratus*.

THUNNUS CORETTA

Description

Günther, 1860.
Jordan and Evermann, 1926.2.
South, 1845.

Distribution

Günther, 1860.
Jordan and Evermann, 1926.2.
South, 1845.

Keys

Jordan and Evermann, 1926.2.

Migrations

Pavesi, 1887.

Recorded from Mediterranean

Cuvier and Valenciennes, 1831.

Synonymy

Günther, 1860.

THUNNUS GERMO. See *Germo alalunga*.

THUNNUS LANCEOLATUS

Anatomy

Storms, 1889.

Description

Agassiz, 1833.
Pictet, 1854.

Fossils from

Italy, early Tertiary

Agassiz, 1833.
Pictet, 1854.

Italy, upper Eocene of Monte Bolca

Eastman, 1911.
Sauvage, 1873.
Woodward, 1901.

Synonymy

Eastman, 1911.

THUNNUS LATIOR

Anatomy

Storms, 1889.

Description

Agassiz, 1833.

Pictet, 1854.

Fossils from

Italy, early Tertiary

Pictet, 1854.

Italy, upper Eocene of Monte Belca

Agassiz, 1833.

Eastman, 1911.

Sauvage, 1873.

Woodward, 1901.

Synonymy

Eastman, 1911.

THUNNUS LEACHIANUS. See *Euthynnus alletteratus*.

THUNNUS LISSA

Description

Willughby, 1686.

Distribution

Willughby, 1686.

Migrations

Willughby, 1686.

THUNNUS MACCOYI

Color

Roughly, 1916.

Description

Jordan and Evermann, 1926.2.

Macleay, 1881.

Roughly, 1916.

Distribution

Jordan and Evermann, 1926.2.

Macleay, 1881.

Habits

Roughly, 1916.

Keys

Jordan and Evermann, 1926.2.

Recorded from Australia

McCulloch, 1922.

Roughly, 1916.

THUNNUS MACROPTERUS

Canning in Japan

Nakamura and Ourakami, 1900.

Statistics, Japan

Nakamura and Ourakami, 1900.

THUNNUS MACROPTERUS. See *Neothunnus macropterus*.

THUNNUS MACULATUS

Distribution

Holder, 1912.

Figured

Holder, 1912.

Recorded from North America, west coast

Holder, 1912.

THUNNUS MEDITERRANEUS. See *Thunnus thynnus*.

THUNNUS OBESUS. See *Parathunnus obesus*.

THUNNUS ORCYNUS

Synonymy

Artedi, 1738.

THUNNUS ORIENTALIS

Anatomy

Kishinouye, 1923.

Classification

Kishinouye, 1923.

Common names, Japanese

Kishinouye, 1923.

Description

Günther, 1860.

Jordan and Evermann, 1926.2.

Jordan and Hubbs, 1925.

Jordan and Jordan, 1922.

Kishinouye, 1923.

Temminck and Schlegel, 1850.

Distribution

Günther, 1860.

Jordan and Evermann, 1926.2.

Temminck and Schlegel, 1850.

Figured

Otaki, Fujita and Higurashi, 1903.

Habitat

Richardson, 1845.

Keys

Kishinouye, 1923.

Recorded from

Hawaii

Jordan and Evermann, 1926.1.

Jordan and Jordan, 1922.

Japan

Jordan and Hubbs, 1925.

Otaki, Fujita and Higurashi, 1903.

Richardson, 1845.

Temminck and Schlegel, 1850.

Korea

Mori, 1923.

Synonymy

Günther, 1860.

Kishinouye, 1923.

Richardson, 1845.

THUNNUS PACIFICUS. See *Germo alalunga*.

THUNNUS PELAMYS. See *Euthynnus pelamis*.

THUNNUS PEREGRINUS

Classification

Collett, 1880.2.

Description

Collett, 1880.1.

Distribution

Collett, 1880.1.

Recorded from Norway

Collett, 1880.1.

Synonymy

Collett, 1880.2.

THUNNUS PHILLIPSII

Description

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

THUNNUS PHILLIPSI—Continued.

Figured

Jordan and Evermann, 1926.2.

Keys

Jordan and Evermann, 1926.2.

THUNNUS PROPTERYGIUS

Anatomy (fossil)

Storms, 1889.

Description

Agassiz, 1833.

Pictet, 1854.

Fossils from early Tertiary of Italy

Agassiz, 1833.

Pictet, 1854.

Sauvage, 1873.

THUNNUS PROXIMUS

Anatomy

Storms, 1889.

Fossils from upper Miocene of Sicily

Woodward, 1901.

THUNNUS QUADRIPUNCTATUS

Recorded from Portugal

Seabra, 1911.

THUNNUS SALIENS

Common names

Craig, 1929.

Description

Jordan and Evermann, 1926.2.

Distribution

Jordan and Evermann, 1926.2.

Figured

Jordan and Evermann, 1926.2.

Keys

Jordan and Evermann, 1926.2.

THUNNUS SARDUS. See *Sarda sarda*.

THUNNUS SCALDISIENSIS

Fossils from Coralline Crag, England

Woodward, 1890.

THUNNUS SCALDISII

Anatomy (fossil)

Storms, 1889.

Fossils from lower Pliocene, England

Woodward, 1901.

THUNNUS SCHLEGELI. See *Thunnus orientalis*.

THUNNUS SECUNDODORSALIS

Color

Storer, 1853.

Compared with Thunnus vulgaris

Storer, 1853.

Description

Breder, 1929.

Jordan and Evermann, 1926.2.

Poey y Aloy, 1875.

Storer, 1853.

Distribution

Breder, 1929.

Jordan and Evermann, 1926.2.

Storer, 1853.

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THUNNUS SECUNDODORSALIS—Cont.

Habitat

Poey y Aloy, 1875.

Keys

Breder, 1929.

Jordan and Evermann, 1926.2.

Recorded from

Cuba

Poey y Aloy, 1875.

Massachusetts

Storer, 1853.

United States, east coast

Baird, 1873.

Gill, 1873.

Used for oil

Storer, 1853.

THUNNUS SIBI. See *Parathunnus sibi*.

THUNNUS SUBULATUS

Description

Jordan and Evermann, 1926.2.

Poey y Aloy, 1875.

Distribution

Jordan and Evermann, 1926.2.

Habitat

Poey y Aloy, 1875.

Keys

Jordan and Evermann, 1926.2.

Recorded from

Cuba

Poey y Aloy, 1875.

West Indies

Jordan, 1887.

THUNNUS THUNNINA. See *Euthynnus alletteratus*.

THUNNUS THYNNUS. See also *Thunnus brachypterus*, Thon, Tuna.

Age

Parona, 1919.

Anatomy

Boulenger, 1910.

Collett, 1902.

Cuvier and Valenciennes, 1831.

Davy, 1835.

Eschricht and Müller, 1835.

Faravelli, 1890.

Frade, 1925.

Goodrich, 1900.

Heldt, 1927.1, 1927.3, 1928.1, 1928.2.

Jordan, 1892.

Jurine, 1821.

Kyle, 1926.

Lilljeborg, 1891.

McIntosh, 1886.1, 1886.2.

Masterman, 1894.

Schulze, 1903.

Shufeldt, 1885, 1901, 1922.

Starks, 1910.

Storms, 1889.

Ancient references

Hoffman and Jordan, 1892.

Keller, 1913.

Rhode, 1890.

Canning

Cobb, 1919.1.

Dollfus, 1927.

Elliott, 1922, 1923, 1924.

THUNNUS THYNNUS—Continued.

Canning—Continued.

Heldt, 1928.1, 1928.2.
Pacific Fish. Stat. No. 1927.1, 1928.1.
Serv. Reg. Announc., 1920.

Chemical analysis

Dill, 1921.1, 1921.2.
Suzuki and Otsuki, 1912.

Classification

Fries, Ekstrom and Sundevall, 1893.
Heldt, 1926, 1927.1, 1927.3.
Jordan and Evermann, 1896.1.
Ninni, E., 1921.1.
Starks, 1910.
Swainson, 1839.

Color

Bigelow, 1925.
Buen, F., 1925.
Nichols, 1922.
Roughly, 1916.
Roule, 1922.
Turton, 1807.

Commensals

Beneden, 1871.
Parona, 1919.

Commercial importance

Bigelow, 1925.
Miranda y Rivera, 1927.
Shufeldt, 1922.

Common names

Buen, F., 1922.
Carus, 1893.
Day, 1880.
Faber, 1883.
Heldt, 1926.
Jordan and Evermann, 1896.2.
Joubin and Le Danois, 1924.
Lacépède, 1829.
Le Danois, 1921.1.
Moreau, 1881, 1892.
Parona, 1898, 1919.
Salviano, 1554.
Sella, 1912.1.

Compared with *Thunnus secundodor-salis*

Storer, 1853.

Considered poisonous in Antilles

Tybring, 1887.

Description

Aldrovandi, 1613.
Atco Fish. News, 1926.
Barnard, 1927.
Baskett, 1899.
Bean, 1903.
Bigelow, 1925.
Bonnaterre, 1788.
Boulenger, 1910.
Brunchorst, 1898.
Brünnich, 1768.
Buckland, 1881.
Buen, F., 1925.
Canestrini, 1870.
Caraffa, 1902.
Carus, 1893.
Century Dictionary, 1906.
Collett, 1880.1.
Corson, 1923.1.
Couch, 1862.
Cunningham, 1893.
Cuvier, 1829, 1884.

THUNNUS THYNNUS—Continued.

Description—Continued.

Cuvier and Valenciennes, 1831.
Day, 1886.
DeKay, 1842.
Devedjian, 1926.
Elliott, 1922, 1923, 1924.
Encyclopaedia Britannica, 1926.
Fitzinger, 1864, 1867.
Fleming, 1828.
Fowler, 1906.
Fries, Ekstrom and Sundevall, 1893.
Giovio, 1524.
Guichenot, 1850.
Günther, 1860, 1876, 1880.
Hamilton, 1843.
Heldt, 1926, 1927.1, 1927.3, 1928.2.
Hildebrand and Schroeder, 1928.
Jenkins, 1925.
Jordan, 1925.2, 1929.
Jordan and Evermann, 1896.1, 1902, 1914, 1926.2.
Jordan and Gilbert, 1883.
Jordan and Jordan, 1922.
Joubin and Le Danois, 1924.
La Blanchère, 1868.
Lacépède, 1829.
Lankester, 1908.
Le Danois, 1921.1.
Le Gall, 1927.2.
Lilljeborg, 1891.
McCoy, 1885.
Macpherson, 1896.
Masterman, 1894.
Meek and Hildebrand, 1923.
Möbius and Heincke, 1884.
Moreau, 1881, 1892.
Mowbray, 1920.
Nichols and Breder, 1927.
Nilsson, 1855.
Ninni, E., 1921.1.
Pacific Fish. Stat. No. 1927.1, 1928.1.
Parona, 1919.
Poey y Aloy, 1865, 1875.
Raveret-Wattel, 1909.
Rhode, 1890.
Risso, 1810, 1826.
Roughly, 1916.
Roule, 1914.1, 1914.3, 1922, 1926.1.
Ruschenberger, 1844.
Salviano, 1554.
Shaw, 1803.
Smith, 1907.
South, 1845.
Starks, 1918.1.
Stead, 1906.
Storer, 1839.1, 1839.2.
Swainson, 1839.
Turton, 1807.
Willughby, 1686.
Yarrell, 1836.

Diseases

Sandeman, 1893.

Distribution

Aldrovandi, 1613.
Barnard, 1927.
Bean, 1903.
Bigelow, 1925.
Bonnaterre, 1788.
Boulenger, 1910.
Brunchorst, 1898.
Buen, F., 1925, 1926.
Carus, 1893.

THUNNUS THYNNUS—Continued.

Distribution—Continued.

- Collett, 1880.1.
 Cuvier, 1829, 1884.
 Cuvier and Valenciennes, 1831.
 Day, 1880.
 DeKay, 1842.
 Encyclopaedia Britannica, 1926.
 Encyclopaedia Americana, 1920.
 Fries, Ekstrom and Sundevall, 1893.
 Goode, 1884.
 Gruvel and Conseil, 1925.
 Guichenot, 1850.
 Günther, 1860, 1876, 1880.
 Heldt, 1926, 1928.1, 1928.2, 1929.1, 1929.2.
 Holder, 1912.
 Jenkins, 1925.
 Jordan, 1905, 1925.1, 1929.
 Jordan and Evermann, 1896.1, 1896.2, 1914, 1926.2.
 Jordan and Gilbert, 1883.
 Jordan, Tanaka and Snyder, 1913.
 La Gorce, 1923.
 Le Danois, 1921.1.
 McCoy, 1885.
 Moreau, 1881.
 New International Encyclopaedia, 1911.
 Nichols and Breder, 1927.
 Nilsson, 1855.
 Ninni, A. P., 1882.
 Parona, 1919.
 Poey y Aloy, 1865.
 Roule, 1914.2.
 Salviano, 1554.
 Shufeldt, 1922.
 Smith, 1907.
 South, 1845.
 Starks, 1918.1.
 Starks and Morris, 1907.
 Stead, 1906.
 Storer, 1839.2.
 Sumner, Osburn and Cole, 1913.
 Tracy, 1907.
 Willughby, 1686.
 Winther, 1879.

Eggs

- Parona, 1919.
 Sanzo, 1910.1.

Enemies

- Bean, 1903.
 Lacépède, 1829.

Figured

- Aldrovandi, 1613.
 Baskett, 1899.
 Couch, 1862.
 DeKay, 1842.
 Devedjian, 1926.
 Elliott, 1922, 1923, 1924.
 Encyclopaedia Britannica, 1926.
 Fitzinger, 1864.
 Fries, Ekstrom and Sundevall, 1893.
 Goodrich, 1900.
 Günther, 1880.
 Hamilton, 1843.
 Holder, 1912.
 Hulit, 1924.
 Jenkins, 1925.
 Jordan, 1925.2.
 Joubin and Le Danois, 1924.
 Kitahara, 1897.
 Lönnberg, 1907.2.

THUNNUS THYNNUS—Continued.

Figured—Continued.

- McIntosh, 1885.
 Miranda y Rivera, 1927.
 Parona, 1919.
 Raveret-Wattel, 1909.
 Starks, 1918.1.
 Ström, 1788.
 Yarrell, 1836.

Fishery

Adriatic

- Faber, 1883.
 Krisch, 1900.

California

- Scofield, N. B., 1919, 1920.

Mediterranean

- Argentier, 1914.
 Buckland, 1881.
 Cuvier and Valenciennes, 1831.
 Floericke, 1923.
 Sella, 1929.

Mexico

- Coleman, 1923.

Spain

- Buen, O., 1923.

Turkey

- Devedjian, 1926.
 Hamilton, 1843.

Fishing season

- Roule, 1914.1.
 Sella, 1912.1.

Food

- Bigelow, 1925.
 Buen, F., 1924, 1925.
 Buen, O., 1924.2.
 Goode, 1884.
 Heldt, 1926.
 Linton, 1901.
 Nichols, 1922.
 Nichols and Breder, 1927.
 Parona, 1919.
 Pêch. Marit., 1925.2.
 Roule, 1919.
 Salviano, 1554.
 Sella, 1929.
 Sumner, Osburn and Cole, 1913.
 Tracy, 1910.

Fossils from

Antwerp, Pliocene

- Storms, 1889.

England, Pleistocene

- Woodward, 1901.

Italy

- Rivière, 1886.
 Volta, 1796.

Norway

- Collett, 1902.

Growth

- Bean, 1903.
 Heldt, 1926, 1927.2, 1928.1, 1928.2.
 Raveret-Wattel, 1909.
 Sella, 1929.
 Tracy, 1910.

Habitat

- Barnard, 1927.
 Hildebrand and Schroeder, 1928.
 Poey y Aloy, 1875.
 Roule, 1917.2, 1922.
 Sella, 1929.

THUNNUS THYNNUS—Continued.

Habits

- Aldrovandi, 1613.
Bigelow, 1925.
Giovio, 1524.
Jordan, 1925.1.
Jordan and Evermann, 1902, 1914.
Kyle, 1926.
La Blanchère, 1868.
Lacépède, 1829.
Raveret-Wattel, 1909.
Roughley, 1916.
Salviano, 1554.
Tracy, 1907.

Industry

- Pavesi, 1889.

Keys

- Delphy, 1916.
Jenkins, 1925.
Jordan and Evermann, 1926.2.
Jordan and Gilbert, 1883.
Moreau, 1892.

Laws regulating fishery in Mediterranean

- Cuvier and Valenciennes, 1831.

Migrations

- Bean, 1903.
Bounhiol, 1911.2.
Bourge, 1915.
Buen, F., 1922, 1924, 1925, 1927.1, 1927.2.
Buen, O., 1924.2.
Callioni, 1887.
Collett, 1875.
Couch, 1862.
Cuvier, 1829.
Cuvier and Valenciennes, 1831.
D'Ancona, 1927.
Daniel, 1925.
Day, 1880.
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- Jordan, 1888.

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- Goode, 1877.

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Buckland, 1881.
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